

HARRY SMIT

WATER MITES OF THE WORLD

with keys to the
families, subfamilies,
genera and subgenera
(Acari: Hydrachnidia)



Monografieën van de Nederlandse Entomologische Vereniging no. 12
2020

Harry Smit, 2020. Water mites of the world, with keys to the families, subfamilies, genera and subgenera (Acari: Hydrachnidia).

Monografieën van de Nederlandse Entomologische Vereniging no. 12.

Author: Harry Smit (Naturalis Biodiversity Center, Leiden)

Editor: Henk Siepel (Radboud University, Nijmegen)

Lay-out: Coco Bookmedia, Amersfoort

Cover images: Wim van Egmond

ISSN 0374-9215

ISBN 978-90-9033622-0

NUR 430

© 2020 Nederlandse Entomologische Vereniging (NEV)

Leiden, The Netherlands

www.nev.nl

All rights reserved. No part of this publication may be reproduced, stored in a retrieval system, or transmitted, in any form or by any means, electronic, mechanical, photocopying, recording or otherwise, without prior written permission of the publisher.

The publisher has sought permission for reuse of images from third parties to the best of its ability. Please contact the publisher in case of any objections or copyright claims.

CONTENTS

Introduction	9
Our present state of knowledge	9
Molecular research	9
Methods	10
The system of water mites	11
Systematic account	25
Superfamily Hydrovolzioidea Thor, 1905	47
Family Acherontacaridae Cook, 1967	47
Family Hydrovolziidae Thor, 1905	50
Superfamily Eylaoidae Leach, 1816	55
Family Apheviderulicidae Gerecke, Smith & Cook, 1999	55
Family Eylaidae Leach, 1816	57
Family Piersigiidae Oudemans, 1902	60
Subfamily Piersigiinae Oudemans, 1902	60
Subfamily Stygolimnocharinae Cook, 1967	62
Family Limnocharidae Grube, 1859	64
Subfamily Limnocharinae, Grube, 1859	64
Subfamily Neolimnocharinae Gerecke, Wohltmann, B.P. Smith & Judson, 2020	67
Subfamily Rhyncholimnocharinae Lundblad, 1936	68
Superfamily Hydrachnoidea Leach, 1816	71
Family Hydrachnidae Leach, 1816	71
Superfamily Hydryphantoidea Piersig, 1896	73
Family Ctenothyadidae Lundblad, 1936	73
Family Hydrodromidae K. Viets, 1936	74
Family Hydryphantidae Piersig, 1896	76
Subfamily Ankelothyadinae Besch, 1964	82
Subfamily Chimerathyadinae Mitchell, 2003	83
Subfamily Cowichaniinae I.M. Smith, 1983	84
Subfamily Cyclothyadinae Lundblad, 1941	84
Subfamily Diplodontinae K. Viets, 1936	85
Subfamily Eupatrellinae K. Viets, 1935	86
Subfamily Euthyadinae K. Viets, 1931	87
Subfamily Hydryphantinae Piersig, 1896	121
Subfamily Mamersinae K. Viets, 1931	124
Subfamily Protziinae Koenike, 1909	124

Subfamily Pseudohydryphantinae K. Viets, 1926	128
Subfamily Tartarothydinae K. Viets, 1934	130
Subfamily Wandesiinae Schwoerbel, 1961	130
Family Rhynchohydracaridae Lundblad, 1936	134
Subfamily Clathrosperchontinae Lundblad, 1936	135
Subfamily Rhynchohydracarinae Lundblad, 1936	137
Subfamily Santiacocarinae Valdecasas, 2001	139
Family Teratothyadidae K. Viets, 1929	140
Family Thermacaridae Sokolow, 1927	143
Family Zelandothyadidae Cook, 1983	144
Subfamily Australiothyadinae Cook, 1986	145
Subfamily Zelandothyadinae Cook, 1983	146
Superfamily Lebertioidea Thor, 1900	151
Family Acucapitidae Wiles, 1996	151
Family Anisitsiellidae Koenike, 1910	152
Subfamily Anisitsiellinae Koenike, 1910	153
Subfamily Nilotoniinae K. Viets, 1929	179
Family Bandakiopsidae Panesar, 2004	194
Family Lebertiidae Thor, 1900	196
Family Limnesiidae Thor, 1900	204
Subfamily Epallagopodinae K. Viets, 1953	208
Subfamily Kawamuracarinae K. Viets, 1943	208
Subfamily Limnesiinae Thor, 1900	210
Subfamily Mixdeinae Orghidan & Gruia, 1980	230
Subfamily Mixolimnesiinae Cook, 1988	233
Subfamily Neomamersinae Lundblad, 1954	234
Subfamily Neotorrenticolinae Lundblad, 1936	239
Subfamily Nicalimnesiinae Cook, 1967	240
Subfamily Protolimnesiinae K. Viets, 1940	241
Subfamily Psammolimnesiinae Cook, 1974	246
Subfamily Raptorhydracarinae Pešić & Gerecke, 2014	246
Subfamily Rheolimnesiinae Goldschmidt, 2004	248
Subfamily Tyrrelliinae Koenike, 1910	250
Family Rutripalpidae Sokolow, 1934	253
Family Oxidae K. Viets, 1926	254
Family Sperchontidae Thor, 1900	258
Subfamily Sperchontinae Thor, 1900	260
Subfamily Apeltosperchontinae Cook, 1974	267
Family Stygotoniidae Cook, 1992	267
Family Teutoniidae Koenike, 1910	268

Family Torrenticolidae Piersig, 1902	270
Subfamily Testudacarinae Cook, 1974	271
Subfamily Torrenticolinae Piersig, 1902	273
Superfamily Hygrobatoidea C.L. Koch, 1842	283
Family Astacocrotonidae Thor, 1927	283
Family Aturidae Thor, 1900	283
Subfamily Albiinae K. Viets, 1925	285
Subfamily Axonopsinae K. Viets, 1929	289
Subfamily Aturinae Thor, 1900	356
Subfamily Notoaturinae Besch, 1964	373
Family Feltriidae K. Viets, 1926	419
Family Ferradasiidae Cook, 1980	423
Family Frontipodopsidae K. Viets, 1931	424
Family Omartacaridae Cook, 1963	426
Subfamily Maharashtra carinae Cook, 1967	428
Subfamily Omartacarinae Cook, 1963	429
Family Hygrobatidae C.L. Koch, 1842	429
Family Lethaxonidae Cook, I.M. Smith & Harvey, 2000	541
Family Pionidae Thor, 1900	544
Subfamily Foreliinae Thor, 1923	548
Subfamily Huitfeldtiinae K. Viets, 1924	553
Subfamily Hydrochoreutinae K. Viets, 1942	555
Subfamily Najadicolinae K. Viets, 1935	556
Subfamily Pioninae Thor, 1900	557
Subfamily Schminkeinae Schwoerbel, 1984	560
Subfamily Tiphyinae Oudemans, 1941	562
Family Pontarachnidae Koenike, 1910	568
Family Wettinidae Cook, 1956	570
Family Unionicolidae Oudemans, 1909	576
Subfamily Encentridophorinae K. Viets, 1935	578
Subfamily Omanohydracarinae Gerecke, 2004	580
Subfamily Pionatacinae K. Viets, 1916	581
Subfamily Pollicipalpinae K. Viets, 1924	612
Subfamily Unionicolinae Oudemans, 1909	614
Superfamily Arrenuroidea Thor, 1900	621
Family Acalyptonotidae Walter, 1911	621
Family Amoenacaridae I.M. Smith & Cook, 1997	622
Family Arenohydracaridae Cook, 1974	624
Family Arrenuridae Thor, 1900	625
Family Athienemanniidae K. Viets, 1922	641

Subfamily Africasiinae Cook, 1974	643
Subfamily Athienemanniinae K. Viets, 1922	644
Subfamily Notomundamellinae Cook, 1986	652
Subfamily Stygameracarinae I.M. Smith, 1990	656
Family Bogatiidae Motaş & Tanasachi, 1948	656
Subfamily Bogatiinae Motaş & Tanasachi, 1948	657
Subfamily Horreolaninae Habeeb, 1956	658
Family Chappuisididae Motaş & Tanasachi, 1946	659
Subfamily Chappuisidinae Motaş & Tanasachi, 1946	660
Subfamily Morimotacarinae Imamura, 1962	661
Subfamily Tsushima carinae Cook, 1974	663
Subfamily Uchidastygacarinae Imamura, 1956	663
Family Harpagopalpidae K. Viets, 1924	665
Family Hungarohydracaridae Motaş & Tanasachi, 1959	667
Subfamily Hungarohydracarinae Motaş & Tanasachi, 1959	668
Subfamily Balcanohydracarinae Cook, 1967	671
Subfamily Cubanohydracarinae Orghidan & Gruia, 1980	671
Family Kantacaridae Imamura, 1959	672
Family Krendowskiiidae K. Viets, 1926	672
Family Laversiidae Cook, 1955	679
Family Mideidae Thor, 1911	679
Family Mideopsidae Koenike, 1910	681
Subfamily Mideopsinae Koenike, 1910	683
Subfamily Gretacarinae K.O. Viets, 1978	696
Subfamily Guineaxonopsinae Imamura, 1983	697
Subfamily Plaumanniinae Lundblad, 1936	699
Family Momoniidae K. Viets, 1926	700
Subfamily Momoniinae K. Viets, 1926	701
Subfamily Cyclomononiinae I.M. Smith, 1989	712
Subfamily Momonidinae Lundblad, 1941	713
Subfamily Stygomomoniinae Motaş & Tanasachi, 1946	713
Family Neoacaridae Motaş & Tanasachi, 1947	716
Family Nipponacaridae Imamura, 1959	718
Family Nudomideopsidae I.M. Smith, 1990	719
Family Cladomomoniidae Orghidan & Gruia, 1980	722
Proposed taxonomical changes	725
Acknowledgements	727
Morphological terms	729
References	733
Index	765

INTRODUCTION

In 1974 Dave Cook published his monumental ‘Water mite genera and subgenera’. For more than four decades this has been the essential work for acarologists working on water mites, especially those studying the world fauna. As stated by Cook (1974), there was no satisfying classification at that time from a phylogenetic point of view. This is still the situation today. Although some recent papers have been published to clarify the higher classification (Cook et al. 2000, Pešić et al. 2013, I.M. Smith et al. 2015, Dabert et al. 2016), many families are still of supposed paraphyletic origin.

Cook (1974) listed 301 genera (including subgenera now considered a genus) and 214 subgenera (synonyms excluded). Since 1974 184 new genera and 60 new subgenera (without synonymized taxa and without *Unionicola* subgenera) have been described, which increases these numbers substantially. Since 1974 44 new subgenera of the genus *Unionicola* have been described, see the chapter on this genus. The total number of genera now tallies 485, the number of subgenera 276 (including two resurrected subgenera). Moreover, 11 new families (with one family synonymized) and 23 new subfamilies (with two subfamilies synonymized) have been described. Quite some taxa have been changed in ranking, e.g. higher in ranking from subfamily to family. The figures mentioned above do not include taxa which have changed in ranking since 1974.

The aim of this publication is to make the world fauna accessible with the help of keys. For each genus a diagnosis is given, as well as its habitat and distribution.

Our present state of knowledge

Large parts of the world are still poorly investigated, especially tropical areas in Africa, South America and SE Asia (Di Sabatino et al. 2008). When Cook (1974) published his ‘Water mite genera and subgenera’, the fauna of the southern hemisphere was very poorly known. This applied especially to Australia, New Zealand and the southern part of South America. The situation improved considerably with the publications of Cook (1983, 1986, 1988) dealing with New Zealand, Australia and Chile, respectively.

Today a number of freshwater habitats are still underinvestigated, e.g. springs and hyporheic habitats. According to Di Sabatino et al. (2008) more than 6,000 species of water mites were known, on July 1, 2020 the number of species tallied 7,500 (pers. com. Joel Hallan). The number of genera was highest in the Neotropical region. Di Sabatino et al. (2008) expected that the number of species will increase to more than 10,000. New genera are described almost every year, and when more research will be done in the underinvestigated biotopes and areas, it is expected that this number will increase significantly.

Molecular research

Molecular research developed greatly since 1974, but few papers deal with the higher classification of water mites. The most important is the study of Dabert et al. (2016). They support the monophyly of the Hydrachnidia including the Hydrovolzioidea. The Stygothrombioidea, however, are no part of the Hydrachnidia. Concerning the internal phylogenetic structure of the water mites, Dabert et al. (2016) showed that six traditionally defined superfamilies (Hydrovolzioidea,

Eylaoidea, Lebertioidea, Hydrachnoidea, Hygrobatoidea and Arrenuroidea) are monophyletic, but that the Hydryphantoidea are of paraphyletic origin. Within the latter superfamily, the Hydrodromidae is the only monophyletic family. Two further important changes result from Dabert et al. (2016). The family Limnesiidae are part of the Lebertioidea (and not Hygrobatoidea). Finally, the genus *Neumania* is a polyphyletic group.

It is clear that much more molecular research has to be done to unravel the higher classification of the water mites. This will take quite some time, as few acarologists are working on this. Given the high number of new taxa described since 1974, I feel that new keys for the genera and subgenera are necessary now. This will be the main goal of this book.

Methods

This book deals with adult water mites, data on larvae and (deuto)nymphs are not included (except one family known only from the deutonymphal stage). Although Stygothromboidea are included in a recent text book (Davids et al. 2007), they are not included in this study. As explained in the introduction, they do not belong to the true water mites, the Hydrachnidia. The key starts with a key to the families, and for each family a key to the subfamilies, genera and subgenera can be found. For each taxon (superfamily, family, subfamily, genus and subgenus) complete references are given. All taxa except superfamilies are given in alphabetical order, after the diagnosis of the nominate taxon. Characters given under the diagnosis of the previous taxon are not repeated. The following abbreviations are used (see also Figs. 1-2): Cx-I – first coxae; Cxgl-4 – coxoglandularia 4; dgl-1 – dorsoglandularia 1; P1-5 – palp segments 1-5, I-leg-4 – fourth segment of first leg. For an explanation of the morphological terms see p. 729. For the glandularia Wiles (1997b) is followed. When the distribution is discussed, worldwide is always without Antarctica, as no water mites have been found there (Pugh & Dartnall 1994). Unless stated otherwise, the nomenclature follows K.O. Viets (1987).

THE SYSTEM OF WATER MITES

Superfamily	Family	Subfamily	Genus	Subgenus
Hydrovolzioidea	Acherontacaridae		<i>Acherontacarus</i>	
			<i>Bharatavolia</i>	<i>Bharatavolia</i>
				<i>Bharatavoliella</i>
	Hydrovolziidae		<i>Hydrovolzia</i>	
			<i>Hydrovolziella</i>	
			<i>Stygovolzia</i>	
Eylaoidea	Apheviderulicidae		<i>Apheviderulix</i>	
	Eylaidae		<i>Eylais</i>	
			<i>Rhyncheylais</i>	
	Limnocharidae	Limnocharinae	<i>Limnochares</i>	<i>Limnochares</i>
				<i>Cyclothrix</i>
			<i>Laterolimnochares</i>	
	Neolimnocharinae		<i>Neolimnochares</i>	
			<i>Archaeveliacola</i>	
			<i>Armaveliacola</i>	
			<i>Isoveliacola</i>	
			<i>Veliacula</i>	
	Rhyncholimnocharinae		<i>Rhyncholimnochares</i>	<i>Rhyncholimnochares</i>
				<i>Paralimnochares</i>
			<i>Austrolimnochares</i>	
Piersigiidae	Piersiginae		<i>Piersigia</i>	
			<i>Austrapiersigia</i>	
	Stygolimnocharinae		<i>Stygolimnochares</i>	
			<i>Parawandesia</i>	
Hydrachnoidea	Hydrachnidae		<i>Hydrachna</i>	
Hydryphantoidea	Hydryphantidae	Hydryphantinae	<i>Hydryphantes</i>	<i>Hydryphantes</i>
				<i>Polyhydryphantes</i>
			<i>Georgella</i>	
	Ankelothyadinae		<i>Ankelothyas</i>	
	Chimerathyadinae		<i>Chimerathyas</i>	
	Cowichaniinae		<i>Cowichania</i>	
	Ctenothyadidae		<i>Ctenothyas</i>	
			<i>Stellulathyas</i>	
	Cyclothydinae		<i>Cyclothyas</i>	
	Diplodontinae		<i>Diplodontus</i>	
	Eupatrellinae		<i>Eupatrella</i>	
			<i>Protziella</i>	
	Euthyadinae		<i>Albertathyas</i>	
			<i>Almuerzothyas</i>	
			<i>Amerothyasella</i>	
			<i>Austrotrombella</i>	
			<i>Columbiathyas</i>	
			<i>Dacothyas</i>	
			<i>Deuterothyas</i>	

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Euthyas</i>	
			<i>Heterothyas</i>	
			<i>Ignacarus</i>	
			<i>Iranothyas</i>	
			<i>Japonothyas</i>	
			<i>Javathyas</i>	
			<i>Kazakhithyas</i>	
			<i>Notopanisus</i>	
			<i>Panisellus</i>	
			<i>Panisopsis</i>	<i>Panisopsis</i>
				<i>Marshallothyas</i>
			<i>Panisus</i>	
			<i>Parathyas</i>	
			<i>Parathyasella</i>	
			<i>Placothyas</i>	<i>Placothyas</i>
				<i>Octothyas</i>
			<i>Siskiyouthyas</i>	
			<i>Tadjikothyas</i>	
			<i>Thyasella</i>	
			<i>Thyasides</i>	
			<i>Thyopsella</i>	
			<i>Thyopsis</i>	
			<i>Thyposoides</i>	
			<i>Trichothyas</i>	<i>Trichothyas</i>
				<i>Kashmirothyas</i>
				<i>Lundbladia</i>
				<i>Neothyas</i>
				<i>Plesiothyas</i>
			<i>Vietsia</i>	
			<i>Zschokkeia</i>	
		Mamersinae	<i>Mamersa</i>	
		Protziinae	<i>Neocalonyx</i>	<i>Neocalonyx</i>
				<i>Otongacarus</i>
				<i>Paracalonyx</i>
			<i>Partnunia</i>	
			<i>Protzia</i>	
		Pseudohydryphantinae	<i>Cyclohydryphantes</i>	
			<i>Pseudohydryphantes</i>	
		Tartarothydinae	<i>Tartarothyas</i>	
		Wandesiinae	<i>Euwandnesia</i>	
			<i>Wandlesia</i>	<i>Wandlesia</i>
				<i>Mesowandnesia</i>
				<i>Partnuniella</i>
	Hydrodromidae		<i>Hydrodroma</i>	
			<i>Oxopsis</i>	
	Rhynchohydracaridae	Clathrosperchontinae	<i>Clathrosperchon</i>	
			<i>Clathrosperchonella</i>	
		Rhynchohydracarinae	<i>Rhynchohydracarus</i>	<i>Rhynchohydracarus</i>
				<i>Coibacarus</i>

Superfamily	Family	Subfamily	Genus	Subgenus
		Santiagocarinae	<i>Gledhillia</i>	
			<i>Santiagocarus</i>	
	Teratothyadidae		<i>Teratothys</i>	<i>Teratothyas</i>
				<i>Ascoteratothyas</i>
			<i>Teratothyasides</i>	<i>Teratothyasides</i>
				<i>Hansvietsia</i>
				<i>Rhynchohansvietsia</i>
	Thermacaridae		<i>Thermacarus</i>	
	Zelandothyadidae	Australiothyadinae	<i>Australiothys</i>	
		Zelandothyadinae	<i>Malgasacarus</i>	
			<i>Zelandothys</i>	
Lebertioidea	Acucapitidae		<i>Acucapito</i>	
	Anisitsiellidae	Anisitsiellinae	<i>Anisitsidartia</i>	
			<i>Anisitsiella</i>	
			<i>Anisitsiellides</i>	
			<i>Bandakia</i>	
			<i>Bitabulata</i>	
			<i>Fuenticola</i>	
			<i>Gilatonia</i>	
			<i>Hydrobaumia</i>	
			<i>Mahemamersides</i>	
			<i>Mamersella</i>	<i>Mamersella</i>
				<i>Neomamersella</i>
			<i>Mamersides</i>	
			<i>Mamersopsis</i>	
			<i>Mamersopsis</i>	
			<i>Navamamersides</i>	
			<i>Nilgiriopsis</i>	
			<i>Paddelia</i>	
			<i>Platymamersopsis</i>	<i>Platymamersopsis</i>
				<i>Lavorona</i>
			<i>Psammotorrenticola</i>	
			<i>Rutacarus</i>	<i>Rutacarus</i>
				<i>Eorutacarus</i>
			<i>Shivatonia</i>	
			<i>Sigthoria</i>	
			<i>Sigthoriella</i>	
			<i>Sotropalpus</i>	
			<i>Stygomamersopsis</i>	
			<i>Utaxatax</i>	<i>Utaxatax</i>
				<i>Rospatax</i>
	Nilotoniinae		<i>Bharatonia</i>	
			<i>Nilotonia</i>	<i>Nilotonia</i>
				<i>Bolivartonia</i>
				<i>Cookonia</i>
				<i>Dartia</i>
				<i>Dartonia</i>
				<i>Davetonia</i>
				<i>Gereckonia</i>
				<i>Guanacastonia</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Mamersonia</i>	
			<i>Manotonia</i>	
			<i>Tadjikodartia</i>	
			<i>Telotaolana</i>	
			<i>Ranautonia</i>	
			<i>Zelandatonia</i>	
	Bandakiopsidae		<i>Bandakiopsis</i>	
			<i>Cookacarus</i>	
			<i>Oregonacarus</i>	
	Lebertiidae		<i>Lebertia</i>	<i>Lebertia</i>
				<i>Brentalebertia</i>
				<i>Eolebertia</i>
				<i>Mixolebertia</i>
				<i>Pilolebertia</i>
				<i>Septlebertia</i>
			<i>Paralebertia</i>	
			<i>Scutolebertia</i>	
Limnesiidae	Epallagopodinae		<i>Epallagopus</i>	
			<i>Kawamuracarinae</i>	<i>Kawamuracarus</i>
			<i>Limnesiinae</i>	<i>Acantholimnesia</i>
				<i>Centrolimnesia</i>
				<i>Fijilimnesia</i>
			<i>Limnesia</i>	<i>Limnesia</i>
				<i>Allolimnesia</i>
				<i>Duralimnesia</i>
				<i>Halolimnesia</i>
				<i>Heterolimnesia</i>
				<i>Limnesiella</i>
				<i>Limnesiellula</i>
				<i>Limnesiopsides</i>
				<i>Limnesiopsis</i>
				<i>Orientilimnesia</i>
				<i>Paralimnesia</i>
				<i>Pilolimnesia</i>
				<i>Seppiella</i>
			<i>Physolimnesia</i>	
			<i>Pterolimnesia</i>	
			<i>Timmsilimnesia</i>	
			<i>Tubophora</i>	
			<i>Tubophorella</i>	
			<i>Xenolimnesia</i>	
	Mixdeinae		<i>Mixdea</i>	
			<i>Tubomixdea</i>	
			<i>Mixolimnesiinae</i>	<i>Mixolimnesia</i>
			<i>Neomamersinae</i>	<i>Arizonacarus</i>
			<i>Meramecia</i>	<i>Meramecia</i>
				<i>Parameramecia</i>
				<i>Submeramecia</i>
			<i>Neomamersa</i>	
	Neotorrenticolinae		<i>Neotorrenticola</i>	

Superfamily	Family	Subfamily	Genus	Subgenus
		Nicalimnesiinae	<i>Nicalimnesia</i>	
		Protolimnesiinae	<i>Crenolimnesia</i>	
			<i>Limnesides</i>	
			<i>Protolimnesia</i>	<i>Protolimnesia</i>
				<i>Protolimnesella</i>
				<i>Voldroguella</i>
		Psammolimnesiinae	<i>Psammolimnesia</i>	
		Raptorhydracarinae	<i>Raptorhydracarus</i>	
		Rheolimnesiinae	<i>Guanacastacarus</i>	
			<i>Rheolimnesia</i>	
			<i>Siboneyacarus</i>	
		Tyrrelliinae	<i>Neotyrellia</i>	
			<i>Tyrellia</i>	<i>Tyrellia</i>
				<i>Scutotyrellia</i>
	Rutripalpidae		<i>Rutripalpus</i>	
	Oxidae		<i>Africoxus</i>	<i>Africoxus</i>
				<i>Pseudofrontipoda</i>
			<i>Oxus</i>	<i>Oxus</i>
				<i>Flabellifrontipoda</i>
				<i>Gnaphiscus</i>
	Sperchontidae	Apeltosperchontinae	<i>Apeltosperchon</i>	
		Sperchontinae	<i>Illesiella</i>	
			<i>Notosperchonopsis</i>	
			<i>Sperchon</i>	<i>Sperchon</i>
				<i>Acadiosperchon</i>
				<i>Hispidosperchon</i>
				<i>Palpisperchon</i>
			<i>Sperchonopsis</i>	<i>Sperchonopsis</i>
				<i>Sperchonopsella</i>
	Stygtoniidae		<i>Stygtonia</i>	
	Teutoniidae		<i>Limnolegeria</i>	
			<i>Teutonia</i>	<i>Teutonia</i>
				<i>Subteutonia</i>
	Torrenticolidae	Testudacarinae	<i>Debsacarus</i>	
			<i>Testudacarus</i>	
		Torrenticolinae	<i>Monactrides</i>	<i>Monactrides</i>
				<i>Pinquicola</i>
				<i>Rusetriella</i>
			<i>Neoactrides</i>	<i>Neoactrides</i>
				<i>Allotorrenticola</i>
				<i>Heteractrides</i>
			<i>Pseudotorrenticola</i>	
			<i>Stygotorrenticola</i>	
			<i>Torrenticola</i>	<i>Torrenticola</i>
				<i>Megapalpis</i>
Hygrobatoidea	Astacocrotonidae		<i>Astacocroton</i>	
	Aturidae	Albiinae	<i>Albia</i>	<i>Albia</i>
				<i>Albiella</i>
				<i>Dentalbia</i>
				<i>Spinalbia</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Parasitalbia</i>	
		Aturinae	<i>Ameribrachypoda</i>	
			<i>Aturides</i>	
			<i>Aturus</i>	<i>Aturus</i>
			<i>Bharatalbia</i>	<i>Bharatalbia</i>
				<i>Bharatalbiella</i>
				<i>Japonalbia</i>
			<i>Kongsbergia</i>	<i>Kongsbergia</i>
				<i>Crocokongsbergia</i>
				<i>Kongsbergiella</i>
				<i>Parakongsbergia</i>
				<i>Pseudokongsbergia</i>
			<i>Neoaturus</i>	
			<i>Phreatobrachypoda</i>	
			<i>Subalbia</i>	
			<i>Subaturus</i>	
		Axonopsinae	<i>Adelaxonopsella</i>	
			<i>Albaxona</i>	
			<i>Axonopsalbia</i>	
			<i>Axonopsella</i>	<i>Axonopsella</i>
				<i>Chilaxonopsella</i>
				<i>Coaxonopsella</i>
				<i>Luciaxonopsella</i>
				<i>Neaoxonopsella</i>
				<i>Paraxonopsella</i>
				<i>Rostaxonopsella</i>
			<i>Axonopsis</i>	
			<i>Barbaxona</i>	
			<i>Barbaxonella</i>	
			<i>Barbaxonopsalbia</i>	
			<i>Brachypoda</i>	
			<i>Brachypodopsis</i>	<i>Brachypodopsis</i>
				<i>Kalobrachypoda</i>
				<i>Navinaxonopsis</i>
			<i>Cubaxonopsis</i>	
			<i>Erebaxonopsis</i>	
			<i>Estellacarus</i>	
			<i>Hexaxonopsalbia</i>	
			<i>Haloaxonopsis</i>	
			<i>Hexaxonopsis</i>	<i>Hexaxonopsis</i>
				<i>Plesiobrachypoda</i>
			<i>Javalbia</i>	<i>Javalbia</i>
				<i>Javalbiopsis</i>
				<i>Megapes</i>
			<i>Javalbiella</i>	
			<i>Kedacarus</i>	
			<i>Lagoenaxonopsalbia</i>	
			<i>Ljania</i>	
			<i>Miraxona</i>	<i>Miraxona</i>
				<i>Miraxonella</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Miraxonides</i>	<i>Miraxonides</i>
				<i>Eomiraxonides</i>
				<i>Miraxonidella</i>
			<i>Neoalbia</i>	<i>Neoalbia</i>
				<i>Neoalbiella</i>
			<i>Neoaxona</i>	<i>Neoaxona</i>
				<i>Lamellaxona</i>
			<i>Neoaxonopsalbia</i>	<i>Neoaxonopsalbia</i>
				<i>Golaxonopsalbia</i>
				<i>Lankaxonopsalbia</i>
			<i>Neoaxonopsis</i>	
			<i>Neobarbaxona</i>	
			<i>Neobrachypoda</i>	
			<i>Ocybrachypoda</i>	
			<i>Omanaxonopsis</i>	
			<i>Parabrächypoda</i>	
			<i>Paraxonopsis</i>	
			<i>Polyaxonopsella</i>	
			<i>Prymnopsella</i>	
			<i>Pseudaxonopsalbia</i>	<i>Pseudaxonopsalbia</i>
				<i>Motasaxona</i>
			<i>Siamaxonopsis</i>	
			<i>Sinaxonopsis</i>	
			<i>Stokaxonopsis</i>	
			<i>Stygaliella</i>	
			<i>Submiraxona</i>	<i>Submiraxona</i>
				<i>Pentalbia</i>
			<i>Sumatralbia</i>	
			<i>Subaxonopsalbia</i>	
			<i>Uenaxonopsis</i>	
			<i>Vagabundia</i>	
			<i>Vicinaxonopsis</i>	
			<i>Villaxonopsalbia</i>	
			<i>Woolastookia</i>	
	Notoaturinae		<i>Abelaturus</i>	
			<i>Acidoturus</i>	
			<i>Amperaturus</i>	<i>Amperaturus</i>
				<i>Shebaturus</i>
			<i>Austraturus</i>	
			<i>Azugaturus</i>	
			<i>Barwontius</i>	
			<i>Bleptaturus</i>	
			<i>Cabellaturus</i>	
			<i>Canterburaturus</i>	
			<i>Colobaturus</i>	
			<i>Davidsia</i>	
			<i>Evidaturus</i>	
			<i>Hestaturus</i>	
			<i>Kritaturus</i>	<i>Kritaturus</i>
				<i>Caudaturus</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Masabania</i>	
			<i>Melanaturus</i>	
			<i>Neotryssatetus</i>	
			<i>Noesaturus</i>	
			<i>Notoaturus</i>	
			<i>Notaxona</i>	
			<i>Omegaturus</i>	
			<i>Paratryssatetus</i>	
			<i>Piotaturus</i>	
			<i>Pilosaturus</i>	
			<i>Planaturus</i>	
			<i>Pseudotryssatetus</i>	
			<i>Schwoerbelaturus</i>	
			<i>Spinaturus</i>	
			<i>Taintaturus</i>	
			<i>Thryptaturus</i>	
			<i>Tryssatetus</i>	
			<i>Twarntaturus</i>	
			<i>Uralbia</i>	
			<i>Valsaturus</i>	
			<i>Zelandalbia</i>	
			<i>Zelandaturus</i>	
			<i>Zelandopsis</i>	
	Feltriidae		<i>Feltria</i>	<i>Feltria</i>
				<i>Azugofeltria</i>
				<i>Feltriella</i>
				<i>Neofeltria</i>
	Ferradasiidae		<i>Ferradasia</i>	
	Frontipodopsidae		<i>Frontipodopsis</i>	<i>Frontipodopsis</i>
				<i>Frontipodopsella</i>
	Omartacaridae	Omartacarinae	<i>Omartacarus</i>	<i>Omartacarus</i>
				<i>Omartacarellus</i>
		Maharashtracarinae	<i>Maharashtracarus</i>	
	Hygrobatidae		<i>Aciculacarus</i>	
			<i>Actinacarus</i>	
			<i>Africacarus</i>	
			<i>Ambiguobatella</i>	
			<i>Ambiguobates</i>	
			<i>Andesobates</i>	
			<i>Asiabates</i>	
			<i>Aspidiobatella</i>	
			<i>Aspidiobates</i>	
			<i>Aspidiobatopsis</i>	
			<i>Atractidella</i>	
			<i>Atractides</i>	<i>Atractides</i>
				<i>Maderomegapus</i>
				<i>Polymegapus</i>
				<i>Typanomegapus</i>
				<i>Australiobatella</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Australiobates</i>	<i>Australiobates</i>
				<i>Lundbladobates</i>
			<i>Australorivacarus</i>	
			<i>Brevaturus</i>	<i>Brevaturus</i>
				<i>Paraspidiobates</i>
			<i>Caenobates</i>	
			<i>Caledoniabates</i>	
			<i>Callumobates</i>	
			<i>Camposea</i>	
			<i>Coaustraliobates</i>	
			<i>Cookabates</i>	
			<i>Corticacarus</i>	<i>Corticacarus</i>
				<i>Corticacarellus</i>
				<i>Corticarides</i>
				<i>Lundbladacarus</i>
				<i>Paracorticacarus</i>
				<i>Polycorticacarellus</i>
				<i>Tetracorticacarellus</i>
			<i>Crenohygrobates</i>	
			<i>Declinatobates</i>	
			<i>Decussobates</i>	
			<i>Diamphidaxona</i>	<i>Diamphidaxona</i>
				<i>Diamphidaxonella</i>
			<i>Dockovdia</i>	
			<i>Dodecabates</i>	
			<i>Dropursa</i>	
			<i>Dropurisides</i>	
			<i>Dubiobates</i>	
			<i>Eocorticacarus</i>	
			<i>Gondwanabates</i>	
			<i>Groonabates</i>	
			<i>Homtinibates</i>	
			<i>Hopkinsobates</i>	
			<i>Hygrobatella</i>	<i>Hygrobatella</i>
				<i>Schwoerbelobatella</i>
			<i>Hygrobates</i>	<i>Hygrobates</i>
				<i>Hygrobatides</i>
				<i>Hygrotetrabates</i>
				<i>Hygrobatomegapus</i>
				<i>Inflatibates</i>
				<i>Lurchibates</i>
				<i>Monobates</i>
				<i>Rivobates</i>
				<i>Schubartella</i>
				<i>Thonia</i>
			<i>Hygrobatopsis</i>	<i>Hygrobatopsis</i>
				<i>Hygrobatopsella</i>
				<i>Hygrobatractides</i>
				<i>Ioannibates</i>
				<i>Iranobates</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Javanella</i>	
			<i>Kallimobates</i>	
			<i>Karlvietsia</i>	
			<i>Knysnabates</i>	
			<i>Kyphohygrobatella</i>	
			<i>Kyphohygrobates</i>	
			<i>Mapuchacarus</i>	
			<i>Megapella</i>	<i>Megapella</i>
				<i>Megapodellides</i>
			<i>Mesobatella</i>	
			<i>Mesobates</i>	
			<i>Mixobates</i>	
			<i>Moramangabates</i>	
			<i>Motasia</i>	
			<i>Neocorticacarus</i>	
			<i>Notohygrobates</i>	
			<i>Osornobates</i>	
			<i>Paraschizobates</i>	<i>Paraschizobates</i>
				<i>Paraaustraliobates</i>
			<i>Plesiohygrobates</i>	
			<i>Polyhygrobatella</i>	
			<i>Procorticacarus</i>	
			<i>Proboscibates</i>	
			<i>Pseudoaustraliobates</i>	
			<i>Rhynchatus</i>	
			<i>Rhynchaustrobates</i>	<i>Rhynchaustrobates</i>
				<i>Victoriabates</i>
			<i>Schizobates</i>	
			<i>Sinhaladwipabates</i>	
			<i>Scutobates</i>	
			<i>Sterkspruitia</i>	
			<i>Stylohygrobates</i>	
			<i>Subcorticacarus</i>	
			<i>Szalayella</i>	
			<i>Tasmanobates</i>	
			<i>Tetrabates</i>	<i>Tetrabates</i>
				<i>Liberiobates</i>
			<i>Tetrahygrobatella</i>	
			<i>Thoracohygrobates</i>	
			<i>Tobelobates</i>	
			<i>Vietnobates</i>	
			<i>Zabobates</i>	
			<i>Zelandobatella</i>	
			<i>Zelandobates</i>	
Lethaxonidae			<i>Lethaxona</i>	<i>Lethaxona</i>
				<i>Eolethaxona</i>
			<i>Lethaxonella</i>	
			<i>Transitia</i>	
Pionidae	Foreliinae		<i>Forelia</i>	
			<i>Madawaska</i>	

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Pionacercopsis</i>	
			<i>Pionacercus</i>	
			<i>Pseudofeltria</i>	
		Huitfeldtiinae	<i>Gereckeia</i>	
			<i>Huitfeldtia</i>	
			<i>Larri</i>	
		Hydrochoreutinae	<i>Hydrochoreutes</i>	
		Najadicolinae	<i>Najadicola</i>	
		Pioninae	<i>Nautarachna</i>	
			<i>Piona</i>	
			<i>Schwoerbelia</i>	
			<i>Twinforksellia</i>	
		Schminkeinae	<i>Schminkea</i>	
		Tiphyinae	<i>Acercella</i>	
			<i>Acercopsis</i>	
			<i>Australotiphys</i>	
			<i>Neotiphys</i>	
			<i>Pionides</i>	
			<i>Pionopsis</i>	
			<i>Tiphys</i>	
		Pontarachnidae	<i>Litarachna</i>	
			<i>Pontarachna</i>	
		Wettinidae	<i>Bromeliacarus</i>	
			<i>Stormaxonella</i>	
			<i>Tasmanaxona</i>	
			<i>Wettina</i>	
			<i>Wheenyella</i>	
			<i>Wheenyoides</i>	
	Unionicolidae	Encentridophorinae	<i>Encentridophorus</i>	<i>Encentridophorus</i>
				<i>Encentridophorellus</i>
		Omanohydracarinae	<i>Omanohydracarus</i>	
		Pionataciniae	<i>Amazonella</i>	
			<i>Ecpolus</i>	
			<i>Esekalla</i>	
			<i>Koenikea</i>	<i>Koenikea</i>
				<i>Diplokoenikea</i>
				<i>Jurucuia</i>
				<i>Koenikella</i>
				<i>Neumanikea</i>
				<i>Notomideopsis</i>
				<i>Parakoenikea</i>
				<i>Pseudokoenikea</i>
				<i>Sespekoenikea</i>
		Neumania	<i>Neumania</i>	
				<i>Allolemenia</i>
				<i>Alloneumania</i>
				<i>Coneumania</i>
				<i>Ecpolopsis</i>
				<i>Lemienia</i>
				<i>Leptopterotrichophorus</i>

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Neoneumania</i>	
			<i>Nicksatax</i>	
			<i>Soarella</i>	
			<i>Subneumania</i>	
			<i>Tetraneumania</i>	
		<i>Nyangalla</i>	<i>Nyangalla</i>	
			<i>Ecpolopella</i>	
			<i>Subkoenikea</i>	
		<i>Pionatax</i>		
		<i>Recifella</i>	<i>Recifella</i>	
			<i>Eorecifella</i>	
			<i>Monokoenikea</i>	
			<i>Recifellida</i>	
			<i>Recifellopsis</i>	
			<i>Vietsiella</i>	
			<i>Schadeella</i>	
			<i>Tanaognathus</i>	<i>Tanaognathus</i>
				<i>Tanaognathella</i>
		<i>Pollicipalpinae</i>	<i>Pollicipalpus</i>	<i>Pollicipalpus</i>
				<i>Pollicipalpella</i>
		<i>Unionicolinae</i>	<i>Unionicola</i>	
			<i>Vietsatax</i>	
Arrenuroidea	Acalyptonotidae		<i>Acalyptonotus</i>	<i>Acalyptonotus</i>
				<i>Paenecalyptonotus</i>
	Amoenacaridae		<i>Amoenacarus</i>	
	Arenohydracaridae		<i>Arenohydracarus</i>	
	Arrenuridae		<i>Allarrenurus</i>	
			<i>Arrenurus</i>	<i>Arrenurus</i>
				<i>Arrhenopsidea</i>
				<i>Arrhenoprosis</i>
				<i>Brevicaudaturus</i>
				<i>Dadayella</i>
				<i>Dividuracarus</i>
				<i>Megaluracarus</i>
				<i>Micruracarus</i>
				<i>Rhinophoracarus</i>
				<i>Rhomborificia</i>
				<i>Truncaturus</i>
			<i>Hamappendix</i>	
			<i>Micruracaropsis</i>	
			<i>Srilankurus</i>	
			<i>Thoracophoracarus</i>	<i>Thoracophoracarus</i>
				<i>Thoracophorurus</i>
			<i>Xenthoracaphorus</i>	
			<i>Wuria</i>	
	Athienemanniidae	<i>Africasiinae</i>	<i>Africasia</i>	
		<i>Athienemanniinae</i>	<i>Anamundamella</i>	
			<i>Bleptomundamella</i>	
			<i>Chelohydracarus</i>	
			<i>Chelomideopsis</i>	

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Mundamella</i>	
			<i>Penemundamella</i>	
			<i>Platyhydracarus</i>	
			<i>Stygohydracarus</i>	<i>Stygohydracarus</i>
				<i>Vicinhydracarus</i>
		Notomundellinae	<i>Davecockia</i>	
			<i>Janszoonia</i>	
			<i>Mellamunda</i>	
			<i>Notomundamella</i>	
			<i>Phreatohydracarus</i>	
		Stygameracarinae	<i>Stygameracarus</i>	
Bogatiidae	Bogatiinae		<i>Bogatia</i>	
		Horreolaninae	<i>Horreolanus</i>	
Chappuisididae	Chappuisidinae		<i>Chappuisides</i>	
		Morimotacarinae	<i>Morimotacarus</i>	
			<i>Yachatsia</i>	
		Tsushima carinae	<i>Tsushima carus</i>	
		Uchidastygacarinae	<i>Uchidastygacarus</i>	<i>Uchidastygacarus</i>
				<i>Imamurastygacarus</i>
Harpagopalpidae			<i>Harpagopalpus</i>	<i>Harpagopalpus</i>
				<i>Harpagopalpellus</i>
Hungarohydracaridae	Hungarohydracarinae		<i>Bharatohydracarus</i>	
			<i>Hungarohydracarus</i>	
			<i>Stygarrenurus</i>	
		Balcanohydracarinae	<i>Balcanohydracarus</i>	
		Cubanohydracarinae	<i>Cubanohydracarus</i>	
Kantacaridae			<i>Kantacarus</i>	
Krendowskiiidae			<i>Allokrendowskia</i>	
			<i>Geayia</i>	<i>Geayia</i>
				<i>Geayella</i>
				<i>Geayidea</i>
				<i>Pirapama</i>
		Krendowskia	<i>Krendowskia</i>	<i>Krendowskia</i>
				<i>Neokrendowskia</i>
		Roqueella	<i>Roqueella</i>	<i>Roqueella</i>
				<i>Pararoqueella</i>
Laversiidae			<i>Laversia</i>	
Mideidae			<i>Eumidea</i>	
			<i>Midea</i>	
Mideopsidae	Mideopsinae		<i>Djeboa</i>	
			<i>Mideopsella</i>	
			<i>Mideopsellides</i>	
			<i>Mideopsides</i>	
		Mideopsis	<i>Mideopsis</i>	<i>Mideopsis</i>
				<i>Wattleopsis</i>
			<i>Neoxystonotus</i>	
			<i>Octomideopsis</i>	
			<i>Penemideopsis</i>	
			<i>Phreatomideopsis</i>	
		Tillia		

Superfamily	Family	Subfamily	Genus	Subgenus
			<i>Tiramideopsis</i>	<i>Tiramideopsis</i>
				<i>Navamideopsis</i>
			<i>Xystonotus</i>	<i>Xystonotus</i>
				<i>Mixomideopsis</i>
		Gretacarinae	<i>Gretacarus</i>	
		Guineaxonopsinae	<i>Guineaxonopsis</i>	
			<i>Kuschelacarus</i>	
		Plaumanniiinae	<i>Plaumannia</i>	
Momoniidae		Momoniinae	<i>Austromomonia</i>	
			<i>Hesperomomonia</i>	
			<i>Momonia</i>	<i>Momonia</i>
				<i>Kondia</i>
				<i>Orientmomonia</i>
				<i>Paramomonia</i>
				<i>Zelandomomonia</i>
			<i>Momoniella</i>	
			<i>Momonisia</i>	
			<i>Neomomonia</i>	
			<i>Notomomonia</i>	
			<i>Partidomomonia</i>	
		Cyclomomoniinae	<i>Cyclomomonia</i>	
		Momonidinae	<i>Momonides</i>	
		Stygomomoniinae	<i>Stygomomonia</i>	<i>Stygomomonia</i>
				<i>Allomomonia</i>
			<i>Xenomomonia</i>	
Neoacaridae			<i>Neoacarus</i>	
			<i>Volsellacarus</i>	
Nipponacaridae			<i>Nipponacarus</i>	
			<i>Allomideopsis</i>	
Nudomideopsidae			<i>Neomideopsis</i>	
			<i>Nudomideopsis</i>	
			<i>Paramideopsis</i>	
Cladomomoniidae			<i>Cladomomonia</i>	

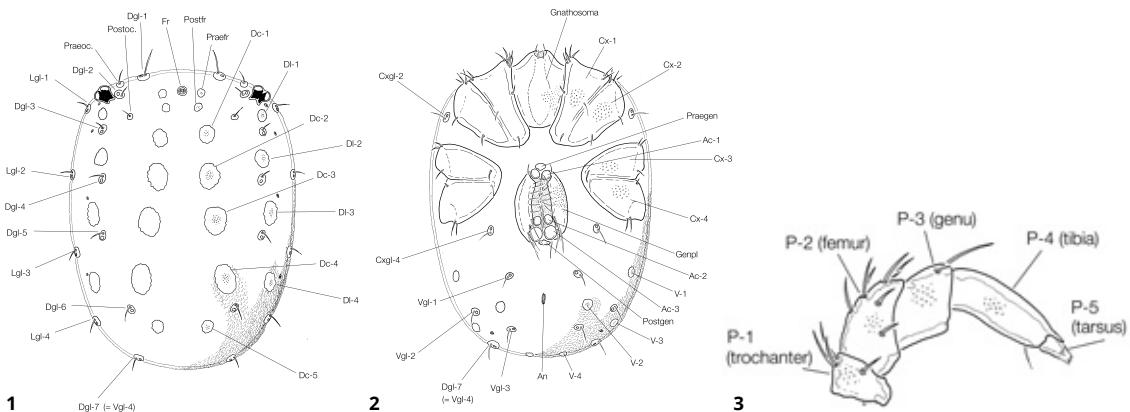
SYSTEMATIC ACCOUNT

Below keys are given for families, subfamilies, genera and subgenera. For the distributional data and taxonomical changes references are given after 1956 only, for data before 1956 see K. Viets (1956b). When only one species is known, in most cases no additional references are given apart from the one listed under the genus name. The keys are based on adults, with a few exceptions of genera known in the preadult stage only.

KEY TO THE FAMILIES (AFTER COOK 1974, DAVIDS ET AL. 2007, DI SABATINO ET AL. 2010, GERECKE ET AL. 2016, I.M. SMITH & COOK 2016)

- 1 Cx-IV with two posterior apodemes and glandularia posterior to genital field wheel-like; marine (Figs. 4-5) Pontarachnidae (pagina 568)
 - Without the above mentioned character combination 2
- 2 Genital field without acetabula (the latter on the coxae, nearly invisible); dorsum with transverse anterior and longitudinal plate 3
 - Genital field in most cases with acetabula (Fig. 6); exceptionally acetabula very small and scattered all over the membranous integument (Fig. 7), frontal area with a monocle-like or elongate eye plate; dorsum smooth or in various ways sclerotized 4
 - 3 Dorsum with a longitudinal plate surrounded by numerous smaller but similar platelets (Fig 8); coxae lying close to each other (Fig. 9) Acherontacaridae (pagina 47)
 - Dorsum with a longitudinal plate surrounded by numerous smaller but dissimilar platelets (Fig 10); coxae clearly separated from each other by soft integument (Fig. 11) Hydrovolziidae (pagina 50)
 - 4(2) P1 longer than P2, P3 longer than P4, the latter segment reduced in size (Fig 12); gnathosoma in ventral view narrowed at the base of the slender and pointed rostrum (Fig. 13); chelicera one-segmented Hydrachnidae (pagina 71)
 - Neither P1 longer than P2 nor P3 longer than P4; gnathosoma not pointed; chelicera two-segmented 5
 - 5 Anterior dorsum with an irregularly reticulated plate surrounding the postocularia (Fig. 14); P4 with two stout dorsodistal setae (Fig. 15) Zelandothyadidae (pagina 144)
 - Anterior dorsum without such reticulate plate and P4 without stout dorsodistal setae 6
 - 6 Gnathosoma broadly widened distally, all palp segments fused (Fig. 16) Apheviderulicidae (pagina 55)
 - Gnathosoma often distally narrower than at its base, palp never with all segments fused 7
 - 7 All coxae fused on their respective sides and slightly fused anteriorly (Fig. 17); gnathosoma with a circular fringe surrounding the mouth opening (Fig. 18); genital field with three pairs of acetabula partially or completely covered by genital flaps (Fig 19) Stygotoniidae (pagina 267)
 - Without the above mentioned character combination 8
 - 8 Mouth opening surrounded by a distinct membranous fringe (as in Fig. 18); lateral eyes on a frontal sclerite (Figs. 20-22) 9

- Membranous fringe surrounding the mouth opening indistinct or absent; lateral eyes, if present, not on a frontal sclerite 11
- 9 Frontal sclerite large, including two pairs of glandularia (Fig. 20) Piersigiidae (pagina 60)
- Frontal sclerite without glandularia 10
- 10 Frontal sclerite much longer than wide (Fig. 21) Limnocharidae (pagina 64)
- Frontal sclerite wider than long, "spectacle-shaped" (Fig. 22) Eylaidae (pagina 57)
- 11 Palp chelate (dorsodistal projection of P4 extending beyond base of P5 (Figs. 23-24) (exception: *Neocalonyx*); gnathosoma lacking anchoral process 12
- Palp rarely chelate; when appearing chelate, then gnathosoma with anchoral process 13
- 12 Pointed dorsodistal projection of P4 reaching tip level of P5 (Fig. 23); idiosoma without dorsal platelets; lateral eyes not in capsules Hydrodromidae (pagina 74)



1 Dorsal idiosoma terminology (after Gerecke et al. 2016)

Fr: Frontale

Dgl-1: Dorsoglandulare 1 (Antenniforme)

Dgl-2-7: Dorsoglandulare 2-7

Dgl-7: Dorsoglandulare 7 (= Vgl-4, Ventroglandulare 4)

Lgl-1-4: Lateroglandulare 1-4

Postoc: Postoculare

Preoc.: Preoculare

Dc-1-4: Dorsocentralia 1-4

Di-1-4: Dorsolateralia 1-4

2 Ventral idiosoma terminology (after Gerecke et al. 2016)

Ac-1-3: Acetabulum 1-3

An: Excretory plate

Genpl: Genital plate

Pregen: Pregenital plate

Postgen: Postgenital plate

Cx-1-4: first to fourth coxae

Cxgl-2: Coxoglandulare 2 (Cxgl-1 and -3 not existing)

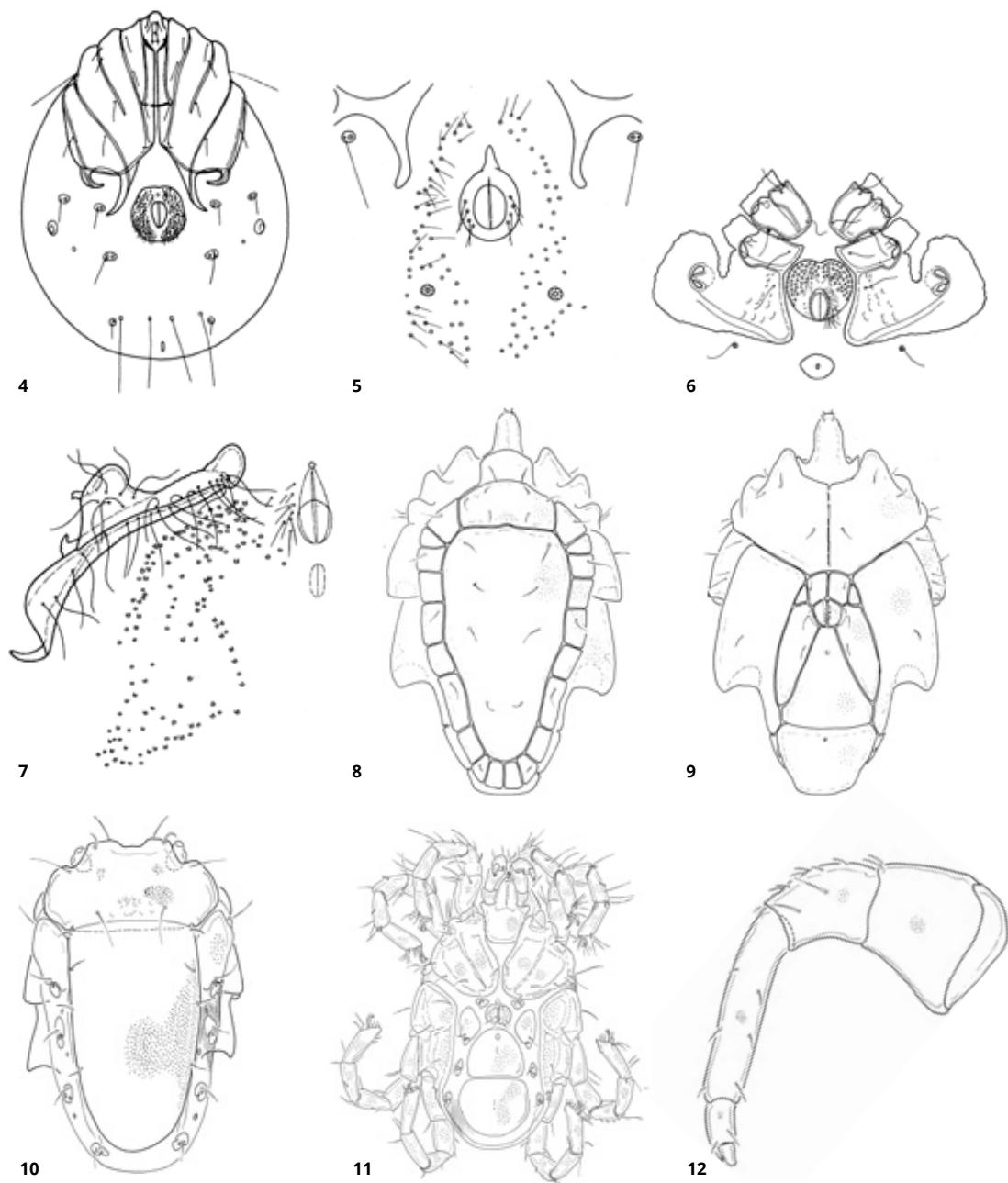
Cxgl-4: Coxoglandulare 4

Dgl-7: Dorsoglandulare 7 (= Vgl-4: Ventroglandulare 4)

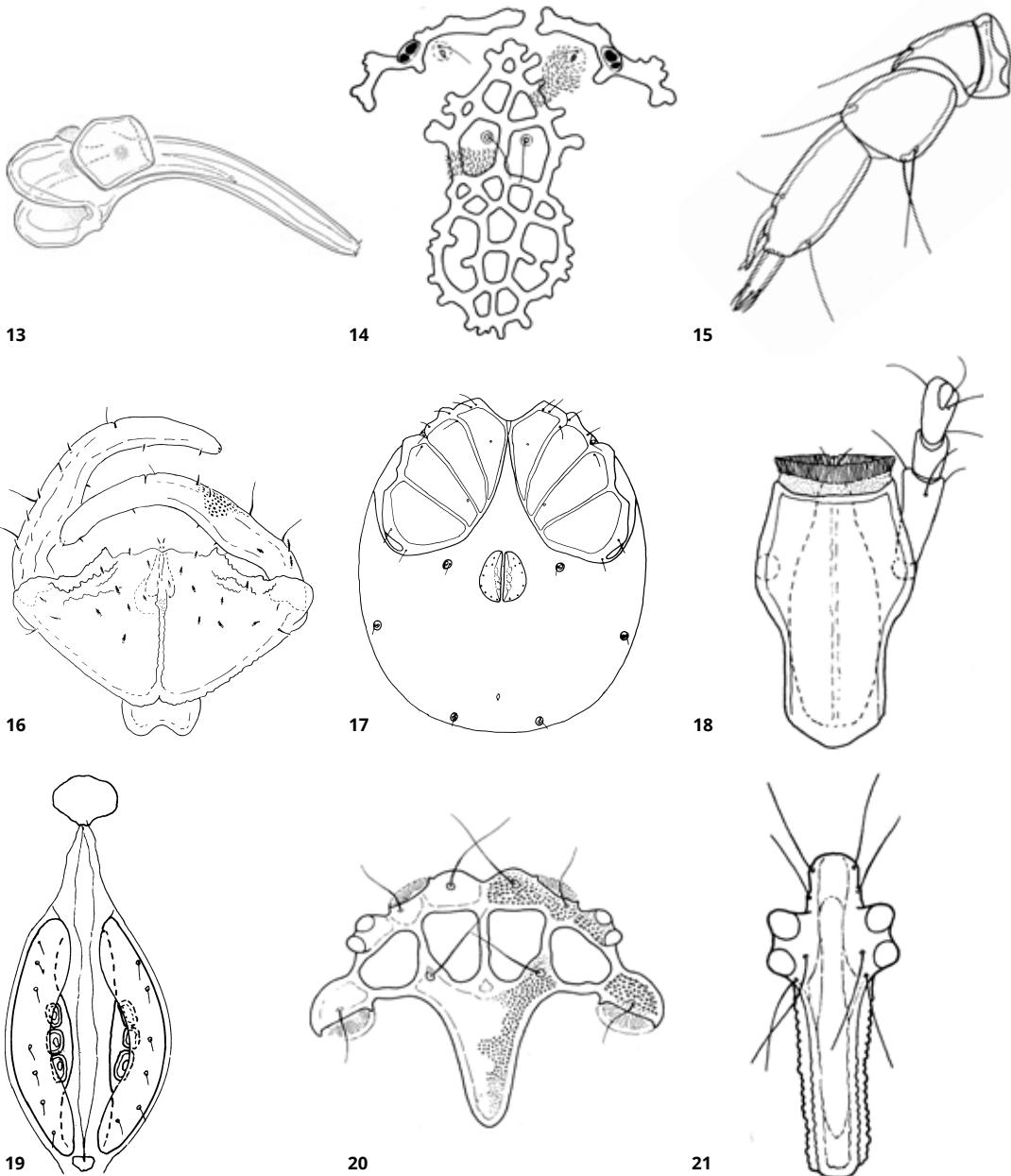
Vgl-1-3: Ventroglandulare 1-3

V-1-4: Ventralia 1-4

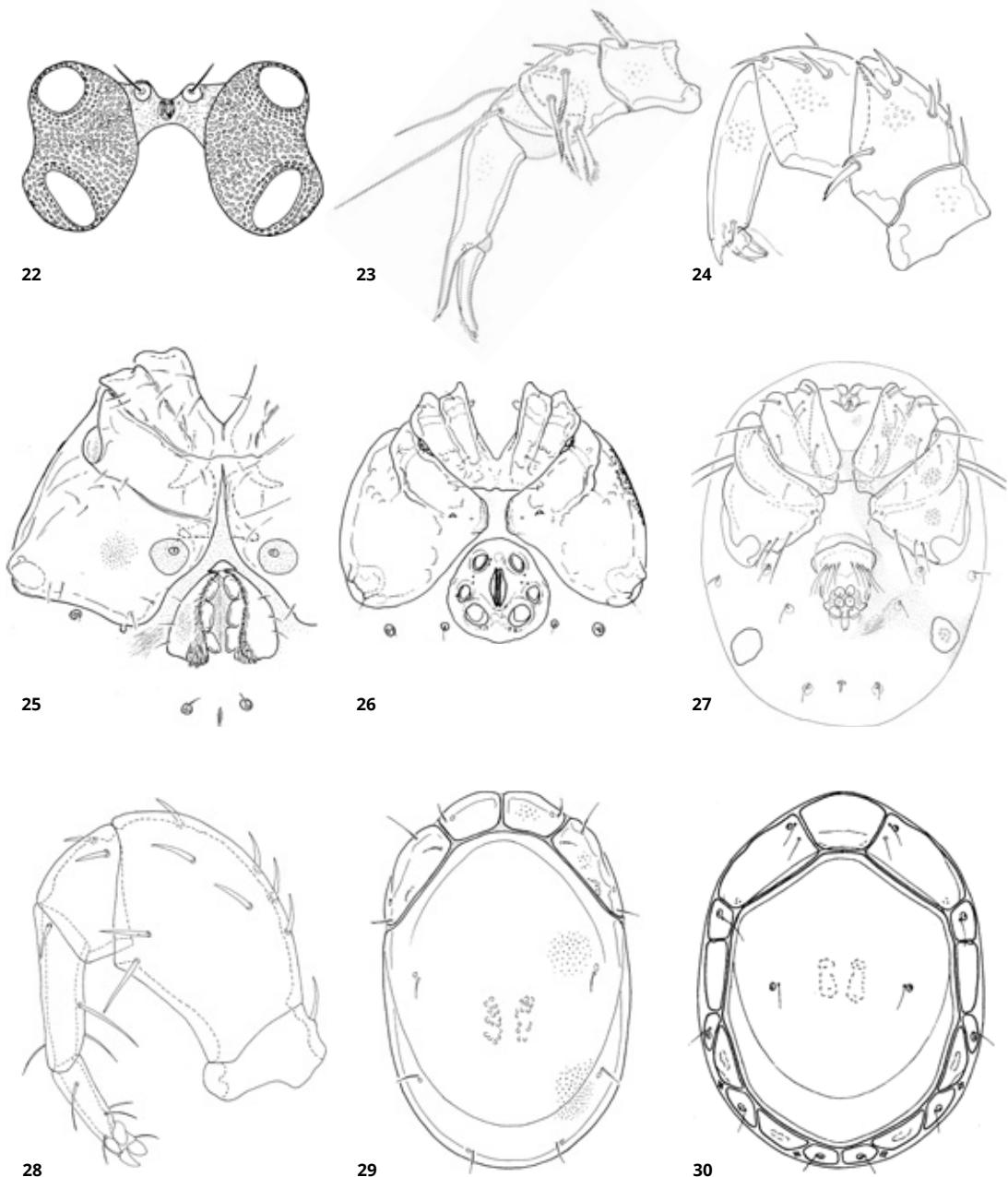
3 Terminology of the palp (after Gerecke et al. 2016)



- 4 *Pontarachna punctulum* Philippi, venter male (after Cook 1974)
- 5 *Litarachna denhami* (Lohmann), genital field male (after Cook 1974)
- 6 *Hydrachna kloomi* Imamura, venter male (after Cook 1974)
- 7 *Limnochares (Cyclothrix) crinita* Koenike, venter female (part.) (after Cook 1974)
- 8 *Acherontacarus nicoleiana* Valdecasas, Artheau & Boutin, dorsum male (after Davids et al. 2007)
- 9 *Acherontacarus nicoleiana* Valdecasas, Artheau & Boutin, venter male (after Davids et al. 2007)
- 10 *Hydrovolzia placophora* (Monti), dorsum male (after Davids et al. 2007)
- 11 *Hydrovolzia placophora* (Monti), venter male (after Davids et al. 2007)
- 12 *Hydrachna cruenta* Müller, palp female (after Davids et al. 2007)

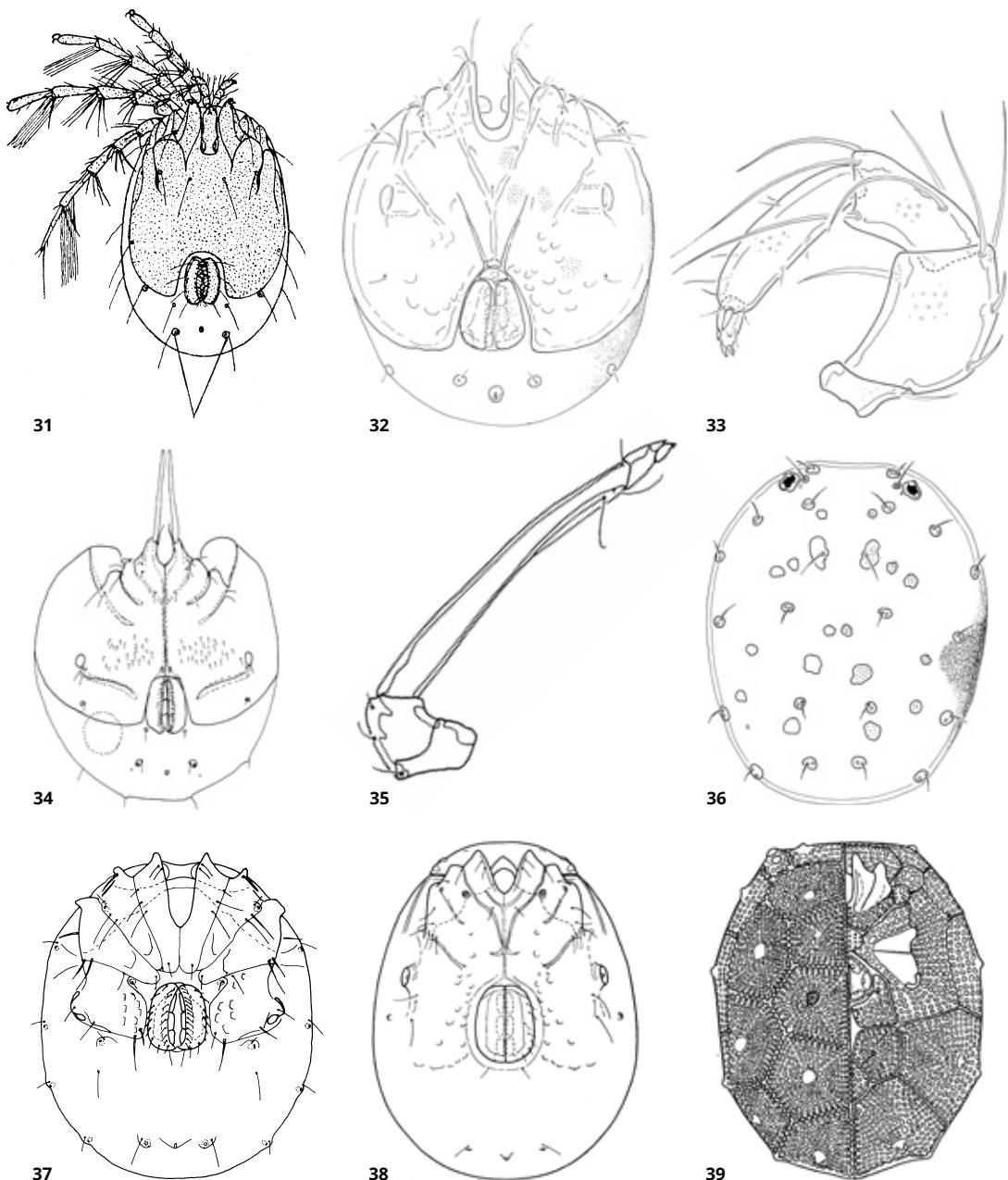


- 13 *Hydrachna incisa* Halbert, gnathosoma female (after Davids et al. 2007)
- 14 *Zelandothys diamphida*, frontal plate female (after Cook 1983)
- 15 *Zelandothys diamphida*, palp female (after Cook 1983)
- 16 *Apheviderulix leptomastax* Gerecke, Smith & Cook, gnathosoma and palps deutonymph (after Gerecke et al. 1999)
- 17 *Stygotonia ambigua* Cook, venter male (after Cook 1992)
- 18 *Stygotonia ambigua* Cook, gnathosoma female (after Cook 1992)
- 19 *Stygotonia ambigua* Cook, genital field female (after Cook 1992)
- 20 *Piersigia limophila* Protz, frontal sclerite female (after Cook 1974)
- 21 *Limnochares (Cyclothrix) crinita* Koenike, frontal sclerite female (after Cook 1974)



- 22 *Eylais extendens* (Müller), frontal sclerite male (after Davids et al. 2007)
23 *Hydrodroma torrenticola* (Walter) palp male (after Di Sabatino et al. 2010)
24 *Diplodontus scapularis* Dugès, palp male (after Di Sabatino et al. 2010)
25 *Teutonia (Teutonia) cometes* (Koch), venter male (after Di Sabatino et al. 2010)
26 *Limnesia (Limnesia) walteri* Migot, venter male (after Gerecke et al. 2016)
27 *Rutripalpus limicola* Sokolow, venter male (after Di Sabatino et al. 2010)
28 *Rutripalpus limicola* Sokolow, palp male (after Di Sabatino et al. 2010)
29 *Monatractides madritensis* (K. Viets), dorsum male (after Di Sabatino et al. 2010)
30 *Testudacarus americanus* Marshall, dorsum female (after Cook 1974)

- Pointed dorsodistal projection of P4 not reaching tip of P5 (Fig. 24); idiosoma usually with variously developed dorsal plate(lets); lateral eyes, if present, in capsules or on plates
 - Hydryphantidae (pagina 76)
- 13 Genital field with movable flaps flanking gonopore and these partially or completely covering gonopore when closed; acetabula lying free in gonopore field, not on flaps or genital plates (Fig. 25) 14
- Genital field usually without movable flaps, if flaps are present then acetabula lie on flaps rather than in the gonopore field (Fig. 26) 22
- 14 Cx-IV medial margins reduced to medial angles and with a pair of glandularia near these angles (Fig. 27); P4 shortened, P5 with terminally with pad-shaped claws and appearing spatulate (Fig. 28)
 - Rutripalpidae (pagina 253)
- Cx-IV with medial margin usually well developed, if medial margins reduced then Cx-IV lacking the glandularia described above; P4 + P5 different in shape 15
- 15 Idiosoma integument soft; Cx-IV with a pair of glandularia or near medial margin surrounded by conspicuous membranous area or on an anteriorly directed protrusion indenting the posterior margin of Cx-III (Fig. 25)
 - Teutoniidae (pagina 268)
- Without above mentioned character combination 16
- 16 Dorsal and ventral shields present; either genital field with six pairs of acetabula and dorsum with a large plate and one or two frontal platelets (Fig. 29), or genital field with three pairs of acetabula and dorsum with a large central plate surrounded by smaller platelets (Fig. 30); ventral shield with a Y-shaped suture line
 - Torrenticolidae (pagina 270)
- Idiosoma with soft integument or various sclerotizations; if a dorsal shield is present, arrangement of dorsal sclerites different and ventral shield without Y-shaped suture line 17
- 17 All legs concentrated in anterior part of idiosoma and directed anteriorly (Fig. 31); coxal plate extending far onto dorsal surface
 - Oxidae (pagina 254)
- Insertions of at least IV-legs near middle of idiosoma or further posteriorly 18
- 18 Coxae fused, forming a characteristic coxal shield with suture lines between Cx-II and Cx-III medially obsolete (Fig. 32) 19
- Venter with suture lines between Cx-II/III complete; if coxae fused, then without Y-shaped suture line as described above 20
- 19 Suture lines between Cx-I and Cx-II forming a Y-shaped figure extending from anterior genital field to tips of Cx-I (Fig. 32); P3 not extremely elongated (Fig. 33)
 - Lebertiidae (pagina 196)
- Suture lines between Cx-I and Cx-II not forming a Y-shaped figure (Fig. 34); P3 extremely elongated (Fig. 35)
 - Acucapitidae (pagina 151)
- 20 Lateral eyes in rounded capsules (Fig. 36); IV-L with claws; various degrees of sclerotizations may be present on venter, but never forming a complete ventral shield
 - Sperchontidae (pagina 258)
- Lateral eyes not in capsules; IV-legs with or without claws; if claws are present, then lateral eyes located on platelets associated with ventral shield (exception: Asian genus *Bharatonia*, with the lateral eyes in well-developed capsules lying free in the integument and fourth legs with claws) 21
- 21 Cx-IV with a glandularium on the end of a finger-like extension (Fig. 37), which can be short and restricted to anteromedial part of Cx-IV or long and extending to anterolateral margins of Cx-I
 - Bandakiopsidae (pagina 194)

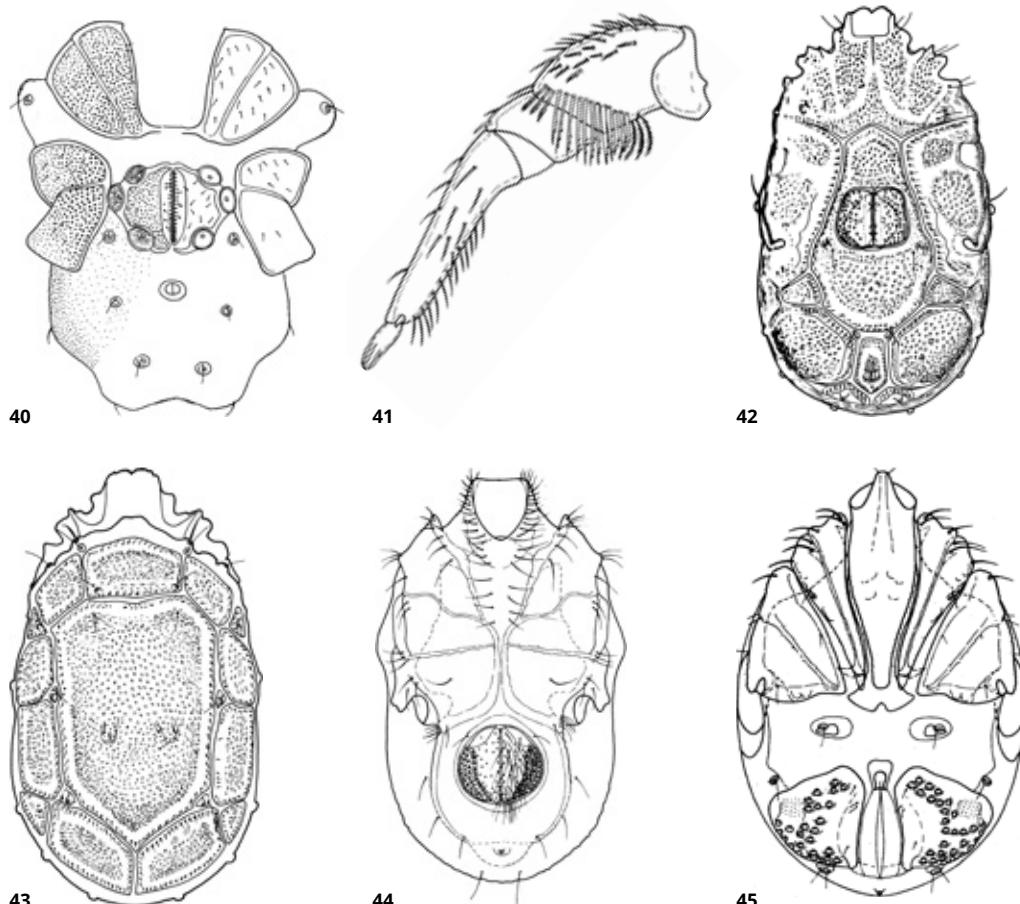


- 31 *Oxus (Oxus) ovalis* (Müller), venter female (after Piersig & Lohman 1901)
- 32 *Lebertia (Mixolebertia) helocrenica* Gerecke, venter female (after Di Sabatino et al. 2010)
- 33 *Lebertia (Lebertia) sparsicapillata* Thor, palp male (after Di Sabatino et al. 2010)
- 34 *Acucapito naso* Wiles, venter (after Wiles 1996)
- 35 *Acucapito naso* Wiles, palp (after Wiles 1996)
- 36 *Sperchon (Hispidosperchon) clupeifer* Piersig, dorsum female (after Di Sabatino et al. 2010)
- 37 *Bandakiopsis fonticola* I.M. Smith, venter male (after I.M. Smith 1979)
- 38 *Anisitsiellides monticolus* Lundblad, venter female (after Cook 1974)
- 39 *Teratothyasides (Teratothyasides) lundbladi* Cook, combination of dorsum and venter female (after Cook 1974)

- Cx-IV either without glandularia or, if present, not on a finger-like extension (Fig. 38) Anisitsiellidae (pagina 152)
- 22(13) Dorsum and venter with a series of closely fitting reticulate platelets (Fig. 39); acetabula varying from three pairs to numerous, at least some acetabula in the membranous gonopore field Teratothyadidae (pagina 140)
- Without the above mentioned combination of characters 23
- 23 Genital field with 3-4 pairs of acetabula on outer margin of movable genital flaps (Fig. 40); legs and palps with numerous short, blade-like setae (Fig. 41), those of legs nearly completely covering segments Ctenothyadidae (pagina 73)
- Without the above mentioned combination of characters 24
- 24 Numerous acetabula on movable genital flaps (Fig. 42); dorsum with closely fitting reticulate or porose platelets (Fig. 43) Rhynchohydracaridae (pagina 134)
- Without the above mentioned combination of characters 25
- 25 Dorsal and ventral shields present; Cx-I with paired rows of long setae extending from tip to base; genital field with acetabula on each side in two groups, in a line on a bar-shaped sclerite flanking the gonopore, and, more numerous, in an elongated patch on posterolateral part of genital flap (Fig. 44); known from hot springs only Thermacaridae (pagina 143)
- Without the above mentioned combination of characters 26
- 26 Females (with membranous posteroventral area, paired genital plates and five dorsal plates): Gnathosoma with long posterior extensions separating medial margins of all coxae (Fig. 45). Males (with complete dorsal and ventral shields): Gonopore narrow and short, shifted far anteriorly, located anterior to gnathosomal base (Fig. 46). Both sexes: Cx-IV without glandularia Ferradasiidae (pagina 423)
- Without the above mentioned combination of characters 27
- 27 Integument soft; idiosoma somewhat elongated; all coxae lying close to each other but not fused, confined to anterior part of idiosoma; medial margins of Cx-I+II longer than medial margin of Cx-III+IV; suture line of Cx-III+IV extending at right angles to midline or slightly posteromedially (Fig. 47); genital plates with numerous acetabula on two elongate genital plates in the female but on a single elongate plate with a posterior gonopore in the male Omartacaridae (pagina 426)
- Without the above mentioned combination of characters 28
- 28 P2 with a ventral seta located either directly on the segment or on a socket, with some rare exceptions (Fig. 48); female acetabula, and also in many males, lying on movable genital flaps (Fig. 49); palp not uncate, claws usually absent from fourth leg Limnesiidae (pagina 204)
- P2 without a single hair-like or peg-like seta on the ventral side; rarely more than one seta may be present on the ventral side of P2; fourth legs with claws 29
- 29 P2 with 2-4 ventral setae, palp not uncate (Fig. 50) 30
- P2 usually without setae (Fig. 51), but when setae are present, palp uncate (Fig. 52) 31
- 30 Dorsal and ventral shields present; a pair of glandularia located in indentations of posterior margin of ventral shield (Fig. 53); palp five-segmented, but functionally fused into a long sickle-shaped segment with P4 much longer than P5; two or three setae present on ventral side of P2 (Fig. 50) Nipponacaridae (pagina 718)
- Dorsal and ventral shields present but without a pair of glandularia located in indentations of posterior margin of ventral shield (Fig. 54); P3 and P4 very short or fused and P1 partly fused with P2; three or four setae on medial side of P2 (Fig. 55) Bogatiidae (pagina 656)

31 Integument soft; coxae forming two groups, Cx-I and Cx-IV with short, peg-like setae (Fig. 56); male with a long petiole (Fig. 57), female with four pairs of acetabula, gonopore much longer than genital plates (Fig. 58). Known only from gill cavities of freshwater crayfish in Australia
 Astacocrotonidae (pagina 283)

- Without the above mentioned combination of characters 32
- 32 I-leg-5 much longer than I-leg-6; claw of first leg enlarged, folded backwards towards segment base to form a character grasping organ (Fig. 59) Momoniidae (pagina 700)
- I-leg-6 not forming a grasping organ 33
- 33 First leg with claw socket at least half as long as I-leg-6 and I-leg-6 longer than I-leg-5 (Fig. 60); idiosoma variously sclerotized but never with a bipartite dorsal shield 34
- First leg claw socket usually less than half as long as I-leg-6 (Fig. 61), when more than half as long, then either I-leg-6 shorter than I-leg-5 or dorsum with a bipartite shield 36



40 *Ctenothyas verrucosa* Lundblad, venter female (after Cook 1974)

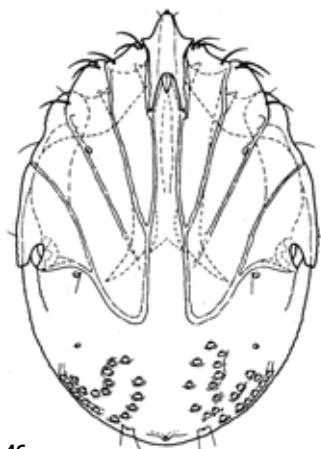
41 *Ctenothyas verrucosa* Lundblad, palp female (after Cook 1974)

42 *Rhynchohydracarus (Rhynchohydracarus) testudo* Lundblad, venter male (after Cook 1974)

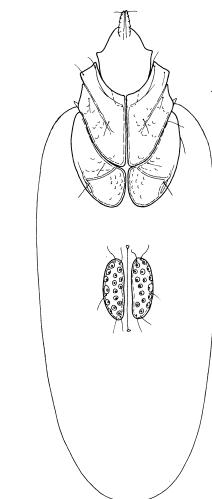
43 *Rhynchohydracarus (Rhynchohydracarus) testudo* Lundblad, dorsum male (after Cook 1974)

44 *Thermacarus nevadensis* Marshall, venter male (after Cook 1974)

45 *Ferradasia musicola* Cook, venter female (after Cook 1980)



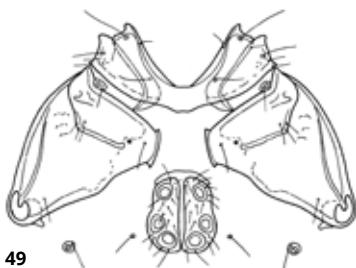
46



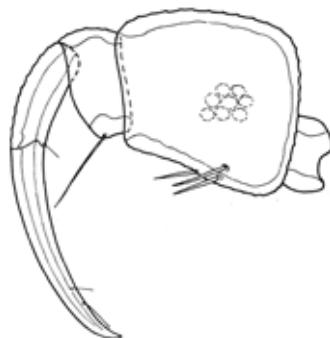
47



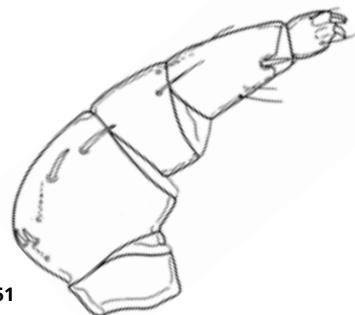
48



49



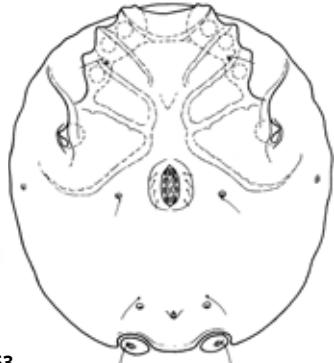
50



51



52



53



54

46 *Ferradasia musicola* Cook, venter male (after Cook 1980)

47 *Omartacarus (Omartacarus) elongatus* Cook, venter female (after Cook 1974)

48 *Limnesia (Limnesia) undulatoides* Davids, palp male (after Gerecke et al. 2016)

49 *Limnesia (Limnesia) lembangensis* Piersig, venter female (after Cook 1974)

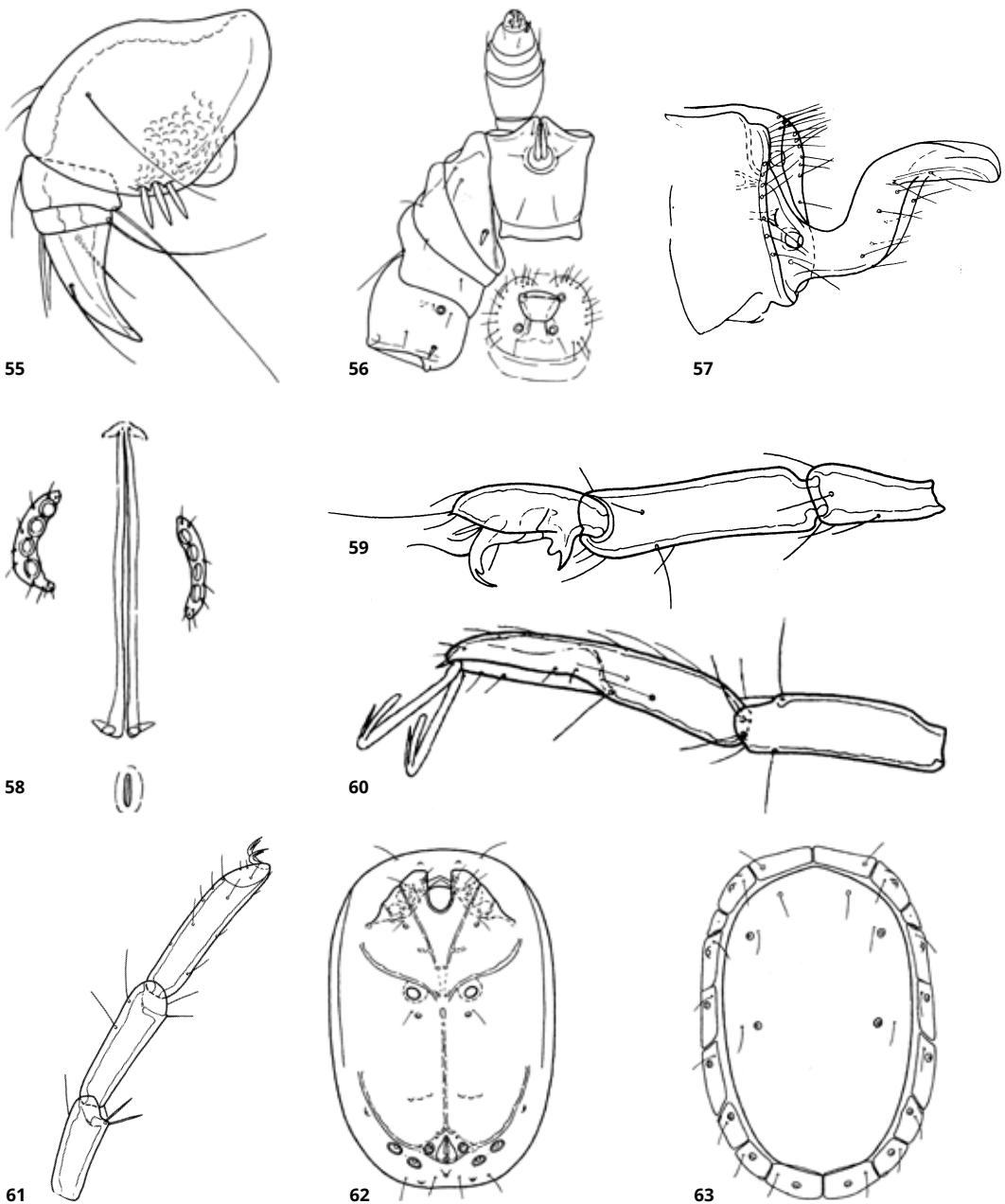
50 *Nipponacarus matsumotoi* Imamura, palp male (after Cook 1974)

51 *Astacocroton molle* Haswell, palp male (after Cook 1974)

52 *Arrenurus (Arrenurus) pseudoaffinis* Piersig, palp male (after Cook 1974)

53 *Nipponacarus matsumotoi* Imamura, venter male (after Cook 1974)

54 *Bogatia maxillaris* Motaş & Tanasachi, venter male (after Cook 1974)



55 *Bogatia maxillaris* Motaş & Tanasachi, dorsal view palp male (after Cook 1974)

56 *Astacrocroton molle* Haswell, venter male (after Cook 1974)

57 *Astacrocroton molle* Haswell, petiole male (after Cook 1974)

58 *Astacrocroton molle* Haswell, genital field female (after Cook 1974)

59 *Momoniella africana* Cook, I-leg-4-6 male (after Cook 1974)

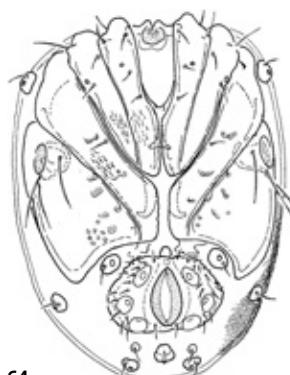
60 *Lethaxona (Lethaxona) kutupalpis* Cook, I-leg-5-6 female (after Cook 1974)

61 *Frontipodopsis (Frontipodopsella) reticulatifrons indicus* Cook, I-leg-4-6 male (after Cook 1967)

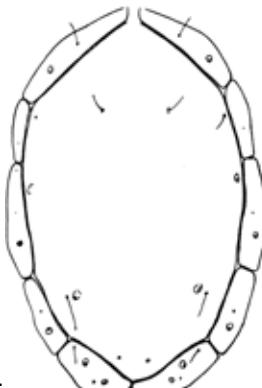
62 *Lethaxona (Lethaxona) panduvarna* Cook, venter female (after Cook 1974)

63 *Lethaxona (Lethaxona) panduvarna* Cook, dorsum female (after Cook 1974)

- 34 Insertions of IV-L close to midline (Fig. 62); dorsum with a central plate surrounded by a ring of 8-9 pairs of smaller platelets (Fig. 63) Lethaxonidae (pagina 541)
- Insertions of IV-L laterally (Fig. 64); dorsum without or with only 5 pairs of platelets 35
- 35 Claws of I-leg-6 very long (Fig. 3080); a dorsal shield present, not surrounded by platelets Cladomomoniidae (pagina 722)
- Claws of I-leg-6 short (Fig. 2460); if a dorsal shield present (only *Stormaxonella*), the central plate surrounded by 5 pairs of platelets only (Fig. 65) Wettinidae (pagina 570)
- 36 Idiosoma strongly laterally compressed (Fig. 66); IV-L segments dorsoventrally expanded and laterally flattened Frontipodopsidae (pagina 424)
- Idiosoma not strongly laterally compressed, fourth leg segments normal in shape or (rarely) laterally flattened 37
- 37 Venter with complete ventral shield, dorsum without sclerotization. Coxae forming one group, with suture line of Cx-III/IV incomplete and medial margin of Cx-IV reduced to sharp angles; Cx-IV without glandularia (Fig. 67) Acalyptonotidae (pagina 621)
- If venter completely sclerotized, also dorsum often with a shield, at least with small sclerotizations; coxae various in shape 38
- 38 Dorsal and ventral shields present; acetabula scattered laterally in integument (these extremely difficult to see, Figs. 68-69) as well as in gonopore region; palp uncate, P4 greatly expanded ventrally, P5 elongate and sharply pointed (Fig. 70) Harpagopalpidae (pagina 665)
- Without the above mentioned combination of characters 39
- 39 Dorsal and ventral shields present; palp uncate; gnathosoma often spoon-shaped, in dorsal view enlarged (Fig. 71), in lateral view appearing pointed, with a pair of long subterminal setae (absent in Plaumanniiinae, Fig. 72) Athienemanniidae (pagina 641)
- Without the above mentioned combination of characters 40
- 40 Dorsal and ventral shields present; median margin of Cx-IV not reaching midline; acetabula in the gonopore field (3-6 pairs in males, 4-9 pairs in females), their basal sclerites fused with genital plates on their respective sides (Fig. 73); palp uncate Neoacaridae (pagina 716)
- Median margin of Cx-IV often reaching midline, acetabula number various, often at least some of them in the ventral sclerotization; palp uncate or not 41
- 41 Dorsal and ventral shields present; dorsal shield with four pairs of glandularia, including a pair anterior to postocularia (Fig. 74); ventral shield variously modified, median margin of Cx-IV long, and suture line Cx-III/Cx-IV extending at right angles to midline with Cxgl-4 located at anteromedial corner of Cx-IV (Fig. 75); palp various, from slightly modified to uncate, or highly modified Chappuisididae (pagina 659)
- Without the above mentioned combination of characters 42
- 42 Dorsal and ventral shields present; Cxgl-2 shifted far forward on Cx-II (Fig. 76); acetabula of female lying in gonopore field (Fig. 77) or on genital plates closely flanking the gonopore (Fig. 78); palp not uncate 43
- Dorsal and ventral shields present or absent; Cxgl-2 not shifted forward on Cx-II; acetabula arrangement various; palp various 44
- 43 Suture lines Cx-III/IV ending far anterior to genital field; genital field of male (with a slit-shaped gonopore) not highly modified, without wing-like sclerites (Fig. 76) Nudomideopsidae (pagina 719)
- Suture lines Cx-III/IV extending to genital field (Fig. 79); male genital field with variously developed wing-like sclerites (Fig. 80) Mideidae (pagina 679)



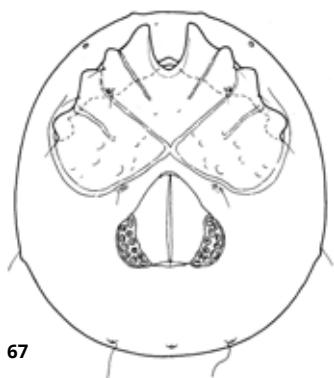
64



65



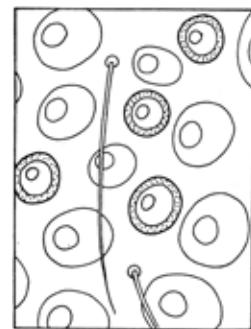
66



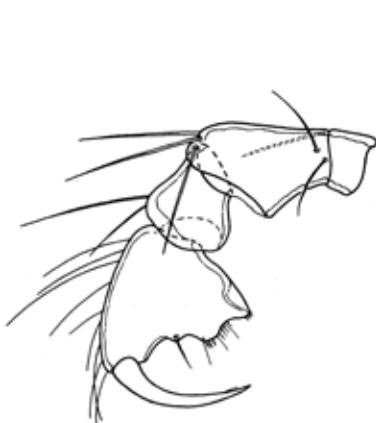
67



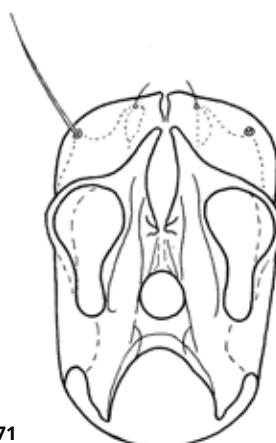
68



69



70

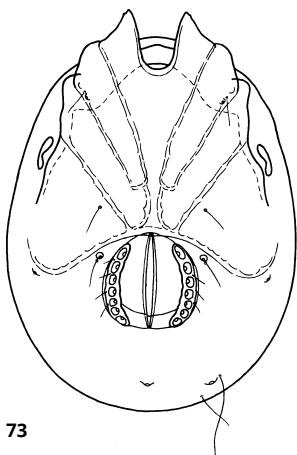


71



72

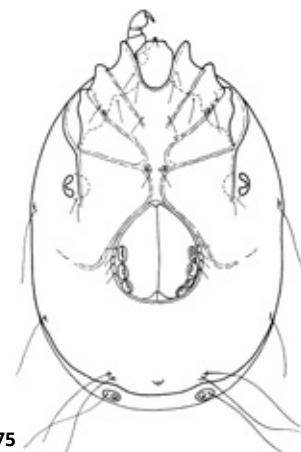
- 64** *Wettina podagrifica* Koch, venter male (after Gerecke et al. 2016)
65 *Stormaxonella scutulata* K.O. Viets, dorsum male (after Cook 1974)
66 *Frontipodopsis (Frontipodopsella) reticulatifrons* Szalay, dorsum male (after Gerecke et al. 2016)
67 *Acalyptonotus (Acalyptonotus) violaceus* Walter, venter female (after Cook 1974)
68 *Harpagopalpus (?) indicus* Cook, venter female (after Cook 1974)
69 *Harpagopalpus (?) indicus* Cook, detail genital field region female (after Cook 1974)
70 *Harpagopalpus (?) indicus* Cook, palp female (after Cook 1974)
71 *Mundamella germanica* K. Viets, dorsal view gnathosoma female (after Cook 1974)
72 *Plaumannia crenophila* Lundblad, lateral view gnathosoma male (after Cook 1974)



73



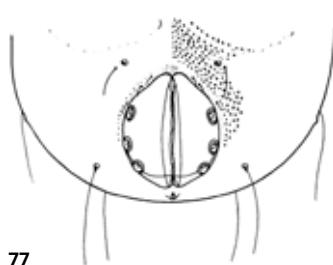
74



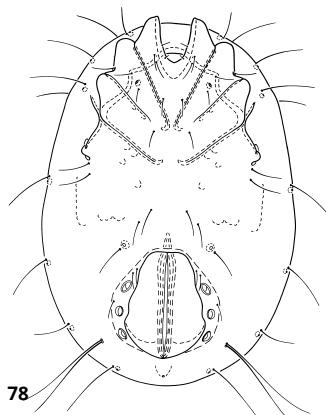
75



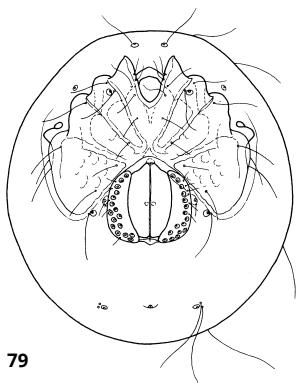
76



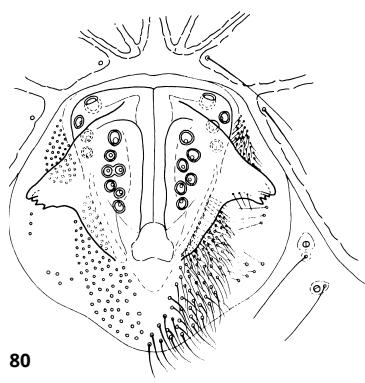
77



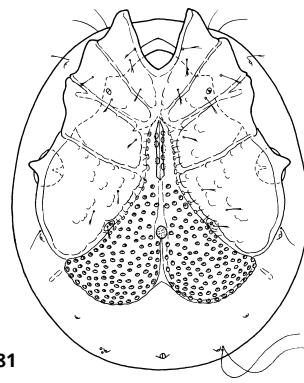
78



79



80



81

73 *Neoacarus occidentalis* Cook, venter female (after Cook 1974)

74 *Chappuisides eremitus* Cook, dorsum male (after Cook 1974)

75 *Chappuisides eremitus* Cook, venter female (after Cook 1974)

76 *Nudomideopsis motasi* (Petrova), venter male (after Cook 1974)

77 *Nudomideopsis motasi* Petrova, genital field female (after Cook 1974)

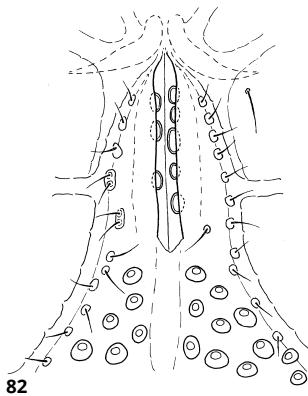
78 *Allomideopsis Wichitaensis* I.M. Smith, venter female (after I.M. Smith 1990b)

79 *Midea expansa* Marshall, venter female (after Cook 1974)

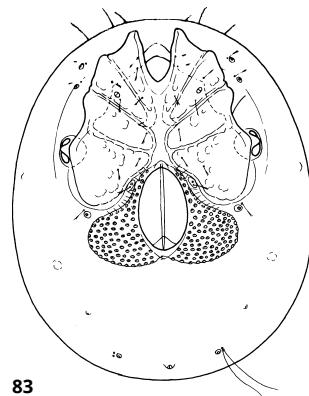
80 *Midea orbiculata* (Müller), genital field male (after Cook 1974)

81 *Laversia berulophila* Cook, venter male (after Cook 1974)

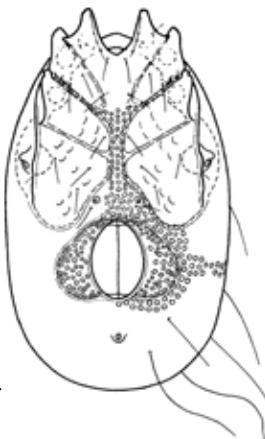
- 44(42) Dorsal and ventral shields present; Cxgl-2 located slightly anterior to suture line Cx-II/III; males (with a slit-shaped, narrow gonopore) with acetabula both on genital plates and in gonopore (Figs. 81, 82) and with genital field anteriorly extending to the level of Cx-II, females (with rounded gonopore field) with acetabula on genital plates with a concave anterolateral margin (Fig. 83); palp not uncate Laversiidae (pagina 679)
- Idiosoma sclerotization various; males: If gonopore shifted between Cx-II, then without acetabula in the gonopore field. Females: Genital plates, if extending laterally, then without concave anterolateral margin 45
- 45 Dorsal and ventral shields present; palp uncate either with P2 with two (near)ventral setae or P2 with a patch of setae; acetabula numerous, on genital plates in female (Fig. 84), confined to gonopore field in male (Fig. 85); palp uncate (Fig. 86) Hungarohydracaridae (pagina 667)
- Idiosoma sclerotization and genital field various; palp uncate or not, taxa with particular ventral setation of P2 have all acetabula included into the ventral sclerotization 46
- 46 Dorsal and ventral shields present; insertions of IV-L covered by lobed extensions of Cx-IV; genital field with three pairs of acetabula on plates fused to the ventral shield flanking gonopore field (Fig. 87); dorsal shield with six pairs of glandularia (Fig. 88) Kantacaridae (pagina 672)
- Generally with more than three pairs of acetabula; if only three pairs present, these confined to the membranous gonopore field 47
- 47 Dorsal and ventral shields present; posterior suture lines of Cx-IV obliterated; male (gonopore field distinctly longer than wide) with 1-2 pairs of acetabula lying in gonopore field, and further acetabula in ventral shield posterior to gonopore (Fig. 89); female (gonopore field slightly longer than wide) with all acetabula in the ventral shield (Fig. 90); P4 with slight distoventral bulge but not forming a true uncate palp (Fig. 91) Arenohydracaridae (pagina 624)
- Genital field various, but not as described above; palp uncate or not 48
- 48 Dorsal and ventral shield present; median margins of Cx-IV reduced to medial angles and with a pair of glandularia located at angles; acetabula located in gonopore field in both sexes (Fig. 92); insertions of IV-L covered by extensions of Cx-IV; palp uncate (Fig. 93) Krendowskiiidae (pagina 672)
- Venter various, but Cx-IV with well developed medial margins and /or without a glandularium in this position 49
- 49 Dorsal and ventral shields present; male genital field located at posterior end of venter and with two pairs of acetabula in gonopore field and several pairs in the ventral shield (Fig. 94); insertions of IV-L covered by extensions of Cx-IV; IV-leg-6 greatly expanded (Figs. 95, 96); females with numerous acetabula lying on plates flanking gonopore field but are separate from ventral shield (Fig. 97); P2 and P4 with a pointed ventral extension (Fig. 98) Amoenacaridae (pagina 622)
- Acetabula (three to numerous pairs) in the ventral shield surrounding gonopore field or on separate genital plates 50
- 50 Dorsal and ventral shield present; acetabula confined to gonopore field in both sexes (Figs. 99, 100); insertions of IV-L with either no or only very small extensions of Cx-IV Mideopsidae (pagina 681)
- Idiosoma sclerotization various; acetabula in the ventral shield or on distinct genital plates flanking gonopore 51



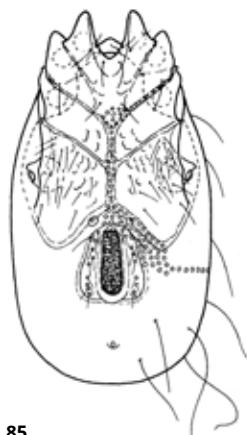
82



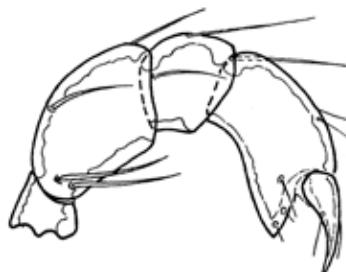
83



84



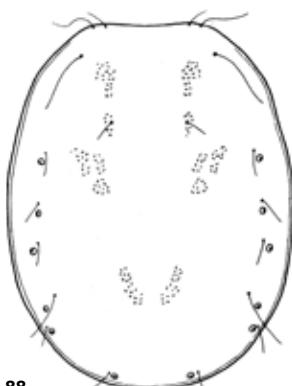
85



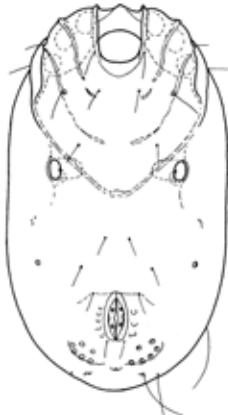
86



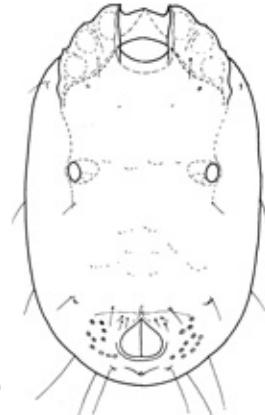
87



88



89



90

82 *Laversia berulophila* Cook, genital field male (after Cook 1974)

83 *Laversia berulophila* Cook, venter female (after Cook 1974)

84 *Bharatohydracarus phreaticus* Cook, venter female (after Cook 1974)

85 *Bharatohydracarus phreaticus* Cook, venter male (after Cook 1974)

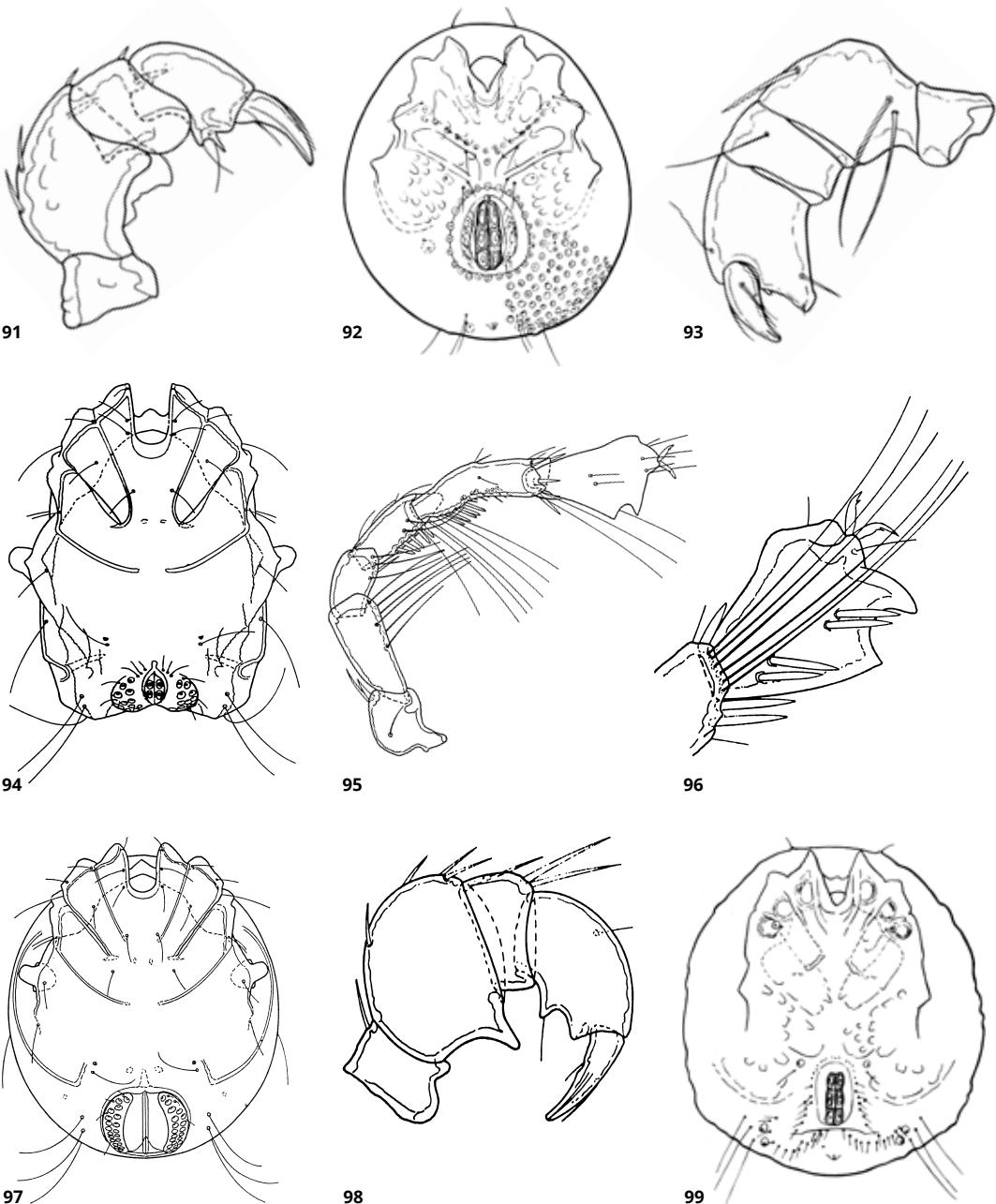
86 *Bharatohydracarus phreaticus* Cook, palp female (after Cook 1974)

87 *Kantacarus matsumotoi* Imamura, venter female (after Cook 1974)

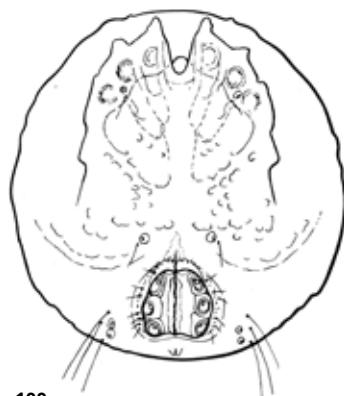
88 *Kantacarus matsumotoi* Imamura, dorsal shield female (after Cook 1974)

89 *Arenohydracarus minimus* Cook, venter male (after Cook 1974)

90 *Arenohydracarus minimus* Cook, venter female (after Cook 1974)



- 91 *Arenohydracarus minimus* Cook, palp male (after Cook 1974)
92 *Krendowskia (Krendowskia) dorsolineata* Lundblad, venter male (after Cook 1974)
93 *Krendowskia (Krendowskia) dorsolineata* Lundblad, palp female (after Cook 1974)
94 *Amoenacarus dixiensis* I.M. Smith & Cook, venter male (after I.M. Smith & Cook 1997)
95 *Amoenacarus dixiensis* I.M. Smith & Cook, fourth leg male (after I.M. Smith & Cook 1997)
96 *Amoenacarus dixiensis* I.M. Smith & Cook, IV-leg-6 male (after I.M. Smith & Cook 1997)
97 *Amoenacarus dixiensis* I.M. Smith & Cook, venter female (after I.M. Smith & Cook 1997)
98 *Amoenacarus dixiensis* I.M. Smith & Cook, palp male (after I.M. Smith & Cook 1997)
99 *Mideopsis (Mideopsis) longidens* Lundblad, venter male (after Cook 1974)



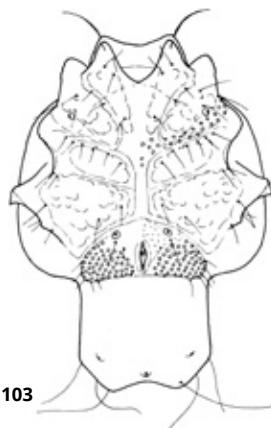
100



101



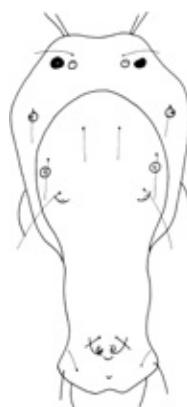
102



103



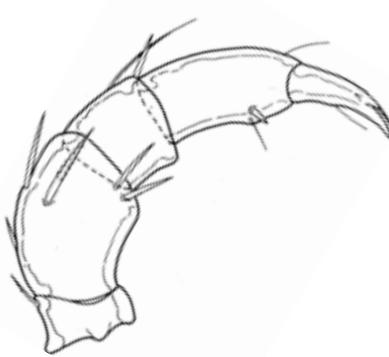
104



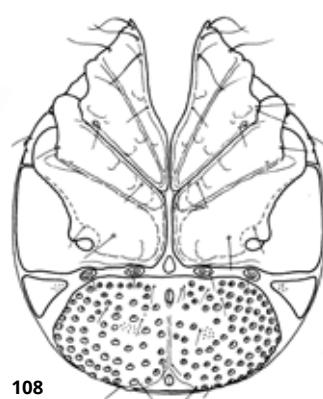
105



106



107



108

100 *Mideopsis (Mideopsis) longidens* Lundblad, venter female (after Cook 1974)

101 *Arrenurus (Megaluracarus) conicus* Piersig, venter male (after Gerecke et al. 2016)

102 *Arrenurus (Megaluracarus) conicus* Piersig, venter female (after Gerecke et al. 2016)

103 *Xenthoracaphorus chilensis* (Cook), venter male (after Cook 1988)

104 *Xenthoracaphorus chilensis* (Cook), gonopore male (after Cook 1988)

105 *Arrenurus (Megaluracarus) securiformis* Piersig, dorsum male (after Gerecke et al. 2016)

106 *Arrenurus (Arrenurus) dadayi* Cook, dorsum male (after Cook 1974)

107 *Micruracopsis phytotelmaticola* (K. Viets), palp male (after Cook 1974)

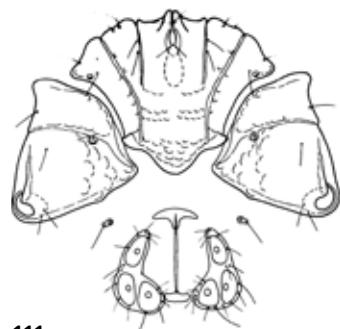
108 *Feltria (Feltria) wyomingensis* Cook, venter male (after Cook 1974)



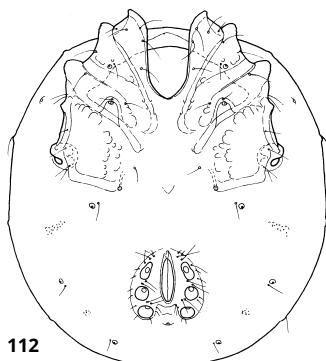
109



110



111



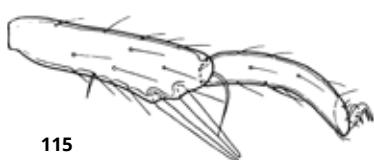
112



113



114



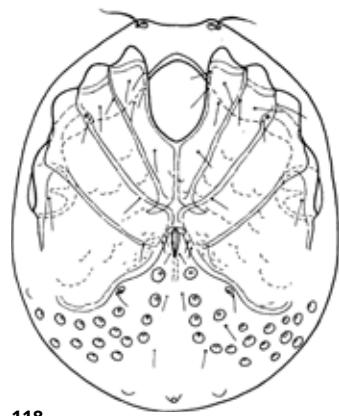
115



116



117



118

109 *Feltria (Feltria) falcicornis* Cook, venter female (after Cook 1974)

110 *Feltria (Feltria) plana* Cook, palp female (after Cook 1974)

111 *Hygrobates (Hygrobates) grimshawi* Cook, venter female (after Cook 1974)

112 *Aspidiobates similis* Cook, venter male (after Cook 1986)

113 *Proctericacarus hirsutus* (K.O. Viets), dorsum male (after Cook 1986)

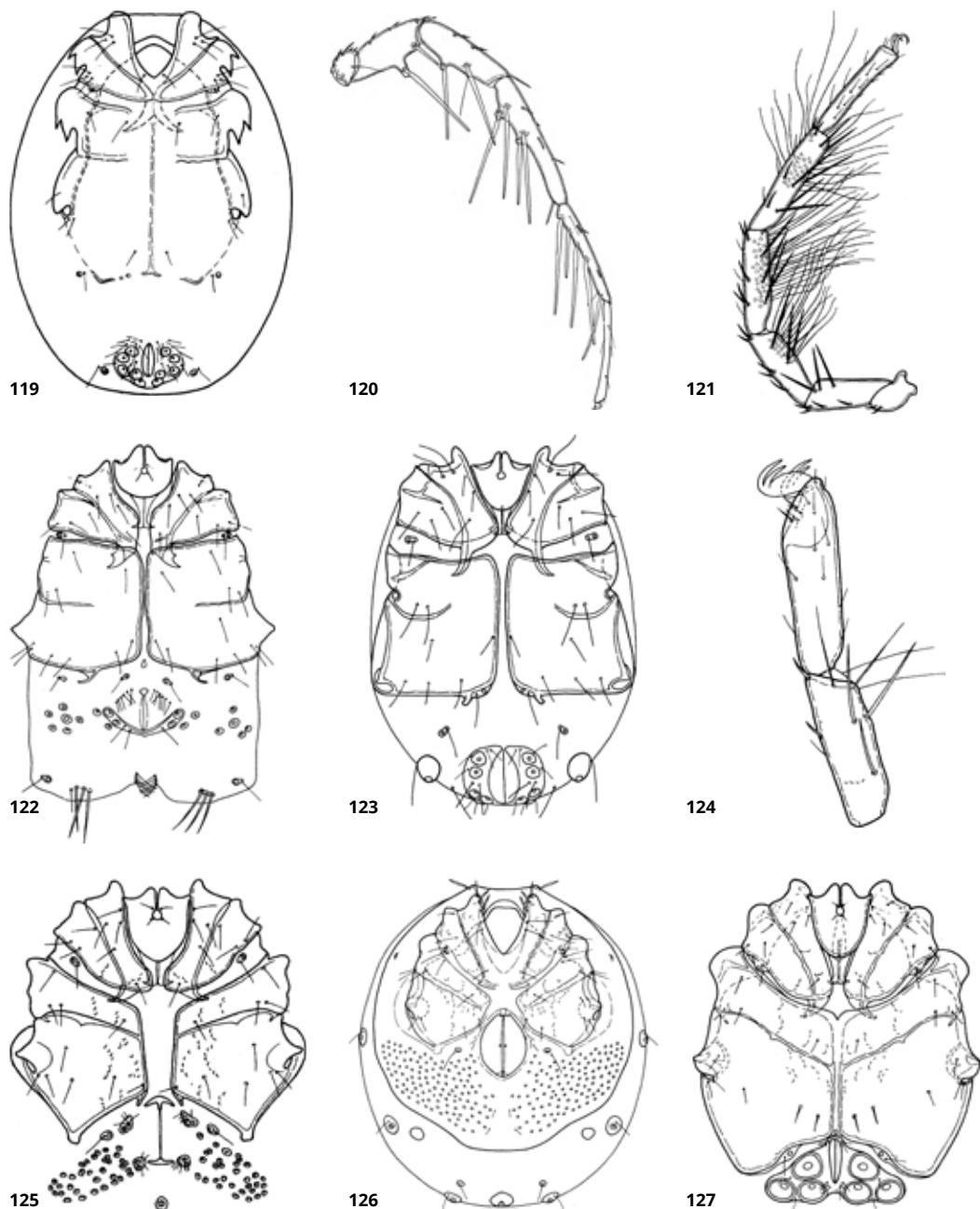
114 *Mixobates inermis* (Cook), I-leg-5-6 female (after Cook 1974)

115 *Atractides (Atractides) ootacamundis* Cook, I-leg-5-6 male (after Cook 1974)

116 *Nautarachna queticoensis* I.M. Smith, IV-leg-4 male (after Cook 1974)

117 *Pseudofeltria laversi* Cook, palp female (after Cook 1974)

118 *Pseudofeltria laversi* Cook, venter male (after Cook 1974)



- 119 *Pollicipalpus (Pollicipalpus) scutatus* K. Viets, venter male (after Cook 1974)
 120 *Unionicola affinis* (Piersig), first leg male (after Cook 1974)
 121 *Encentridophorus (Encentridophorus) alatus* Cook, fourth leg male (after Cook 1974)
 122 *Encentridophorus (Encentridophorus) similis* Cook, venter male (after Cook 1974)
 123 *Unionicola affinis* (Piersig), venter male (after Cook 1974)
 124 *Forelia floridensis* Cook, I-leg-5-6 female (after Cook 1974)
 125 *Piona damasiella* Cook, venter female (after Cook 1974)
 126 *Nautarachna queticoensis* I.M. Smith, venter female (after Cook 1974)
 127 *Pionopsis paludis* Habeeb, venter male (after Cook 1974)

51	Dorsal and ventral shields present; acetabula numerous, confined to genital plates extending laterally from gonopore and embedded in the ventral shield (Fig. 101, 102) (exception: the genus <i>Xenthoracaphorus</i> from Chile with a pair of acetabula in the gonopore field, Figs. 103, 104); female idiosoma relatively unmodified (Fig. 102), male with moderately to extremely modified posterior idiosoma, often cauda-like extended (Fig. 105) and with an unpaired terminal petiole (Fig. 106); palp uncate (exception: a <i>Micruracaropsis</i> species from a bromeliad in Surinam, Fig. 107)	Arrenuridae (pagina 625)
-	Idiosoma sclerotization various, with or without dorsal and ventral shields; males may have variously developed cauda like structures, but in general without development of an unpaired petiole; palp not uncate	52
52	Dorsum with sclerotizations varying from scattered platelets to a complete dorsal shield; typically, venter between Cx-IV and genital field with two pairs of glandularia in a transverse line (Figs. 108, 109); P2 lacking a peg-like seta (Fig. 110)	Feltriidae (pagina 419)
-	Sclerotizations of dorsum variable; venter typically without two pairs of glandularia between Cx-IV and genital field; when these glandularia are present, then P2 with a peg-like seta	53
53	A pair of glandularia present on Cx-IV (Fig. 111), occasionally extending far anteriorly on an anteriorly directed loop of suture line (Fig. 112)	54
-	Glandularia absent from Cx-IV	55
54	Usually soft bodied, but a few to many dorsal or ventral platelets may be present (Fig. 113); if complete dorsal and ventral shields present, then I-leg-5 mediodistally with a characteristic fine, downturned seta (Figs. 114, 115)	Hygrobatidae (pagina 429)
-	Dorsal and ventral shields present, I-leg-5 without a characteristic fine, downturned seta	Aturidae (in part) (pagina 283)
55(53)	Dorsal and ventral shields present	56
-	Dorsal and ventral shields absent, scattered platelets may be present	58
56	Genital field with numerous acetabula (> 10 pairs); either IV-leg-4 of male concave on one side with numerous peg-like setae (Fig. 116), or median surface of P4 with a peg-like seta at distal end (Fig. 117) and coxal plates lacking well-developed projections associated with insertions of IV-leg (Fig. 118)	Pionidae (in part) (pagina 544)
-	Number of acetabula various, from three to numerous pairs; if male fourth leg modified, not as described above	57
57	Insertions of fourth legs with large associated projections that extend laterally or only slightly posteriorly, or when projections extend decidedly posteriorly (Fig. 119), then P4 with lateral projections	Unionicolidae (in part) (pagina 576)
-	Openings for projections of fourth legs with either small or no associated projections, or, when large projections present they are directed or decidedly posterolaterally; P4 lacking lateral projection	Aturidae (in part) (pagina 283)
58(55)	Claws simple or with clawlets (Fig. 121); first leg usually with numerous grooved or fluted setae (Fig. 120); posterior margin of Cx-IV truncate or only slightly rounded, generally with a short apodeme projecting in the centre (Figs. 122, 123)	Unionicolidae (in part) (pagina 576)
-	Claws always with clawlets (Fig. 124); first leg without fluted or grooved setae; posterior margin of Cx-IV generally forming an obtuse or acute angle in the centre (Figs. 125-127)	Pionidae (in part) (pagina 544)