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OUR PRESENT KNOWLEDGE OF AUSTRALIAN WATER-MITES (*HYDRACHNELLÆ* ET *HALACARIDÆ*).

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We know but very little till now about water-mites from Australia. The recently published description of a new genus and species of *Halacaridæ* and the redescription of a species of *Hydrachnellæ* gave a chance to compile what is known to-day about these animals.

I. HYDRACHNELLÆ.

1. FROM THE CONTINENT.

The first freshwater-mite known from the Australian Continent seems to be (1)* *Hydrachna odonthognatha* Canestrini,¹ collected from a water-beetle from Queensland.

About twenty years later W. J. Rainbow, in his "Synopsis of Australian Acarina",² added two more species: (2) *Eylais maccullochi* Rainb. and (3) *Unionicola cumberlandensis* (Rainb.) from ponds at Parramatta. Both species belong to the genus in which the author has placed them, but it seems impossible now to recognize the species and to compare them with others of the two genera.

In 1914 F. Koenike³ described (4) *Unionicola cirrosa* Koen. from the gills of *Unio nepeanensis* Less. We do not know the habitat of this mite.

W. A. Haswell in 1922 published a study⁴ on (5) *Astacocroton molle* Hasw. living in the gill-cavity of the common spiny crayfish (*Astacopsis serratus*). Haswell's paper is principally devoted to the internal anatomy of this interesting mite. It will be necessary to breed the larvæ of *Astacocroton* in order to understand its real relations and to fix its systematic position (cf. Viets, Zool. Anz., Bd. xcvi, 1931, p. 85).

Only these four species of *Hydrachnellæ* have been recorded from the continent till now, a very meagre result relative to this widely distributed group of Acari.

* Running numbers.

¹ G. Canestrini.—Acari dell' Austria (Atti R. Instituto veneto sci., lett., arti. Venezia, (6), II, 1884 [separ. p. 27]).

² W. J. Rainbow.—Rec. Austral. Mus., VI, 3, 1906, p. 159.

³ F. Koenike.—Abhandl. Nat. Ver. Bremen, XXII, 1914, p. 397.

⁴ W. A. Haswell.—Proc. Linn. Soc. N.S.W., XLVII, 3, 1922, p. 329.

2. MARINE HYDRACHNELLÆ AND FAUNA OF THE ISLANDS.

The only known marine species of *Hydrachnellæ* is (6) *Litarachna denhami* (Lohm.)⁵ from Shark's Bay, near Denham.

Some more work has been done in water-mites in the faunæ of the adjacent Australian islands. The following authors and mites may be cited:

F. Koenike,⁶ 1900:

(7) *Eylais schauinslandi* Koen., from New Zealand, d'Urville, Cook Strait.

E. v. Daday,⁷ 1901:

(8) *Lemienia multipora* (Dad.) }
 (9) *Piona piersigi* (Dad.) } from New Guinea.
 (10) *Arrenurus koenikei* (Dad.) }

R. Piersig,⁸ 1898 and 1904:

(11) *Arrenurus dahlī* Piers. }
 (12) „ *laticodulus* Piers. }
 (13) „ *latipetiolatus* Piers. }
 (14) „ *altipetiolatus* Piers. }
 (15) „ *bicornutus* Piers. } from Bismarck Archipelago.
 (16) „ *lohmanni* Piers. }
 (17) „ *quadricaudatus* Piers. }
 (18) „ *matupitensis* Piers. }
 (19) „ *quadricornutus* Piers. }
 (20) *Oxus dahlī* Piers. }

A. C. Oudemans,⁹ 1905 and 1906:

(21) *Limnesia jamurensis* Oudms. This is the immature stage (*Nymphophan*-stage) of a freshwater-mite, but it does not belong to the genus *Limnesia*.

Ch. Walter,¹⁰ 1911:

(22) *Hydrachna mertoni* Walt. }
 (23) *Mamersa rouxi* Walt. }
 Arrenurus dahlī Piers. }
 „ *quadricornutus* Piers. }
 (24) *Arrenurus pulcher* Walt. } From Terangan, Aru Islands.
 (25) „ *alatus* Walt. }
 (26) „ *angustiscutatus* Walt. }
 (27) *Encentridophorus chelatus* Walt. }
 (28) *Piona bipunctata* Piers. }

⁵ H. Lohmann.—Marine Hydrachnidæ und Halacaridæ (Die Fauna Südwest-Australiens, II, 2, 1909, p. 151).

⁶ F. Koenike.—Zool. Jbch., Syst., XIII, 1900, p. 125.

⁷ E. v. Daday.—Mikroskopische Süßwassertiere aus Deutsch-Neu-Guinea (Ter-meszetr. Füzetek, XXIV, 1901, p. 50).

⁸ R. Piersig.—In- und ausländische Hydrachniden (Zool. Anz., Bd. XXI, 1898, p. 569). Beiträge zur Kenntnis der Hydrachniden-Fauna des Bismarck-Archipels (Arch. Naturgesch., 1904, Bd. I, 1, p. 1-34).

⁹ A. C. Oudemans.—Acarol. Aanteeken, XVII (Entom. Ber., Deel I, 1905, p. 223). Acari (Nova Guinea. Résult. Expéd. Néerlandaise., V, Zool., 1906, p. 101).

¹⁰ Ch. Walter.—Hydracarina der Aru-Inseln. (Abh. Senckenberg. Natf. Ges., Bd. XXXIV, 1911, p. 209).

Ch. Walter,¹¹ 1915:

- (29) *Eylais incerta* Walt.
- (30) *Oxus orientalis* Walt.
- (31) *Unionicola longiseta* Walt.
- (32) „ *crassipalpis* Walt.
- (33) *Encentridophorus sarasani* Walt.
- (34) *Neumania neo-caledonica* Walt.
- (35) *Piona diversa* Walt.
- (36) *Arrenurus depressus* Walt.
- (37) „ *multicornutus* Walt.
- (38) „ *rouxi* Walt.
- „ *dahli* Piers.

From New Caledonia.

Ch. Walter,¹² 1929:

- (39) *Piona pseudouncata* Piers. from Christchurch, New Zealand.

II. HALACARIDÆ.

1. FRESHWATER HALACARIDÆ FROM THE CONTINENT.

Only one species of freshwater Halacaridæ is known from Australia: (1) *Astacopsiphagus parasiticus* Viets,¹³ occurring in the branchial chambers of *Astacopsis serratus*. This mite is the only species of this group of Acari living as a true parasite. Till now the nymphæ of *Astacopsiphagus* only have been described.

2. MARINE HALACARIDÆ.

Our knowledge of the marine mites living between the tide marks and in the deep sea, the Halacaridæ *s. str.*, we find partly compiled in Rainbow's paper (*l.c.*, p. 161). There are few records since then and some synonyms should be added here.

Earliest of all authors in the group but not cited in Rainbow's synopsis we found Chas. Chilton,¹⁴ who gave the description of *Halacarus parvus* Chilt. and *Halacarus truncipes* Chilt., taken between high and low water marks at Lyttelton Harbour, New Zealand. As pointed out in undertaking the re-description of Chilton's type-slides, the two species now should be named (2) *Agauæ parva* (Chilt.) and (3) *Halixodes truncipes* (Chilt.).¹⁵

H. Lohmann¹⁶ described several species from Sydney:

- (4) *Agauæ hispida* (Lohm.).
- (5) „ *panopæ* (Lohm.).
- „ „ forma *squamifera* (Lohm.).
- „ „ forma *setifera* (Lohm.).

¹¹ Ch. Walter.—Les Hydracariens de la Nouvelle-Calédonie (Sarasin and Roux, Nova Caledonia, Zool., II, ii, 7, 1915, p. 97).

¹² Ch. Walter.—Hydracarinæ aus Java (Treubia, XI, 2, 1922, p. 221).

¹³ K. Viets.—Über eine an Krebskiemen parasitierende Halacaride aus Australien. (Zool. Anz., XCVI, 1931, p. 115).

¹⁴ Chas. Chilton.—On two marine mites (Trans. New Zealand Institute, XV, 1883, p. 190).

¹⁵ K. Viets.—Die Halacaridae der Nordsee. (Z. wiss. Zool., CXXX, 1927, p. 89, 91).

¹⁶ H. Lohmann.—Ergebnisse d. Plankton-Exped., Bd. II, G, a, b, 1893.

- (6) *Agauæ chevreuxi* (Trt.).
- (7) *Copidognathus pulcher* (Lohm.).
- (8) „ *lamellosus* (Lohm.).
- (9) *Halacarus oblongus* (Lohm.).

Later on¹⁷ H. Lohmann added to these mites:

- (10) *Copidognathus australiensis* (Lohm.).
- (11) *Agauopsis hirsuta* (Trt.) and *Agauæ panopæ* (Lohm.) from Western Australia (Shark's and Champion Bay).

The number of 39 known species of Hydrachnellæ and 11 of Halacaridæ is small considering the large dimensions of continental and oceanic Australia, the great number of species known from other parts of the world, and the number of water mites in particular, or the Acari in general. Further investigations, especially in running waters as creeks, streams, and springs, surely will bring valuable results for zoogeography. For determination water-mites should be preserved in a solution of 3 vols. water + 2 acetic acid + 5 glycerine, not alcohol or formaline.

¹⁷ H. Lohmann.—Fauna Südwest-Australiens, l.c., 1909, p. 153.