

NOTES ON THE GENUS *NEOEUCHEYLA* RADFORD, 1950 (ACARI: CHEYLETIDAE) WITH DESCRIPTION OF A NEW SPECIES FROM IRAN

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ABSTRACT - A new species, *Neoeucheyla iranica* (Acari: Cheyletidae), is described. It is represented by a single female collected from floor debris in a silo that had contained wheat grain, near Tehran, Iran. The status of the genus *Neoeucheyla* Radford, 1950 is discussed.

Key words - Acari, Cheyletidae, taxonomy, new species, silo, grain debris, Iran.

RÉSUMÉ - Une nouvelle espèce est décrite dans le genre *Neoeucheyla* Radford, 1950: *N. iranica* n.sp. (Acari: Cheyletidae). Cette espèce n'est connue que par l'holotype femelle, lequel fut découvert dans la poussière et les débris tapissant le plancher d'un silo qui avait contenu des graines de blé, dans les environs de Tehran, Iran. Le statut du genre *Neoeucheyla* est discuté.

Mots clés - Acari, Cheyletidae, taxinomie, nouvelle espèce, silo, débris graines, Iran.

INTRODUCTION

During investigations of the mite fauna infesting stored grain in Iran, the junior author discovered a new species of mite of the genus *Neoeucheyla* Radford, 1950 (Cheyletidae). This new mite is represented by only one female specimen. It was found in the dust covering the floor of a silo that had contained wheat grain, near Tehran, Iran. This species is compared with the 12 other valid species included in the three related genera *Neoeucheyla*, *Cunlifella* Volgin (1969) and *Bothrocheyla* Volgin (1964). The 12 morphological characters that we have used for this comparative study had been proposed by Bochkov and Mironov (1997) in their cladistic study of this group of mites. This new approach of the problem of the validity of the genus *Bothrocheyla* had revealed several new characters which can be used in the identification of these genera. By using this method we arrived to the conclusion that our species is new, and we name it *Neoeucheyla iranica*.

All measurements are taken in micrometers (μm) Setal nomenclature of the idiosomal setae follows Fain *et al.* (1997) and Gerson *et al.* (1999).

Genus *Neoeucheyla* Radford, 1950

Neoeucheyla iranica nov. spec. (Figs. 1-4, 9-13)

FEMALE, holotype (Figs. 1-4, 9-13) - Idiosoma 390 long and 318 wide. Total length (including gnathosoma) 490. **Dorsum** - With two large median shields bearing 30 (15 pairs) setae of which 23 neotrichial, strongly modified setae present in median part, flattened, irregular in shape, bearing a faint, irregular reticulum and devoid of granulations. In addition to these, 7 small circles present on shields representing insertion bases of broken setae during mounting. Ten pairs of flabellate dorsolateral setae represent normal setae, i.e. 5 pairs of propodonal (*vi*, *ve*, *sci*, *sce* and *h*) and 5 pairs of laterals (*II* to *I5*), all very large (60 long and 65 wide to 75 long and 78 wide). Eye lenses strongly convex and projecting, 24 wide. **Venter** - Anterior seta of coxa III flabellate, other coxal setae piliform. Posterior setae on coxae I absent. Posteroanal setae flabelliform and inserted at 60 μm from posterior margin of body. **Gnathosoma** (Fig. 2) - Length 114 in mid line and maximum width 132. **Palps** - Tibial claw 30 long and 8.5 wide, bearing 5 strong teeth, except the most basal one smaller. All teeth situated on apical

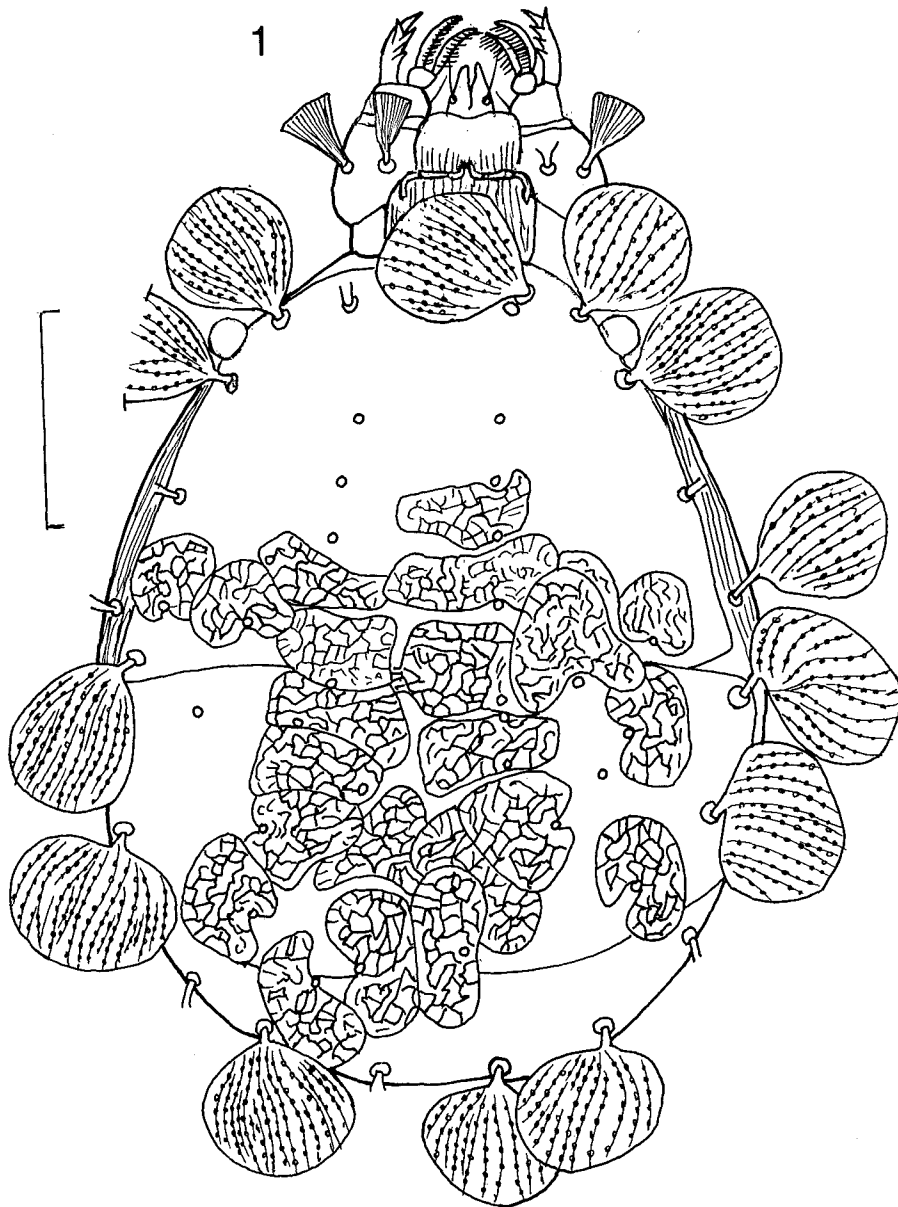
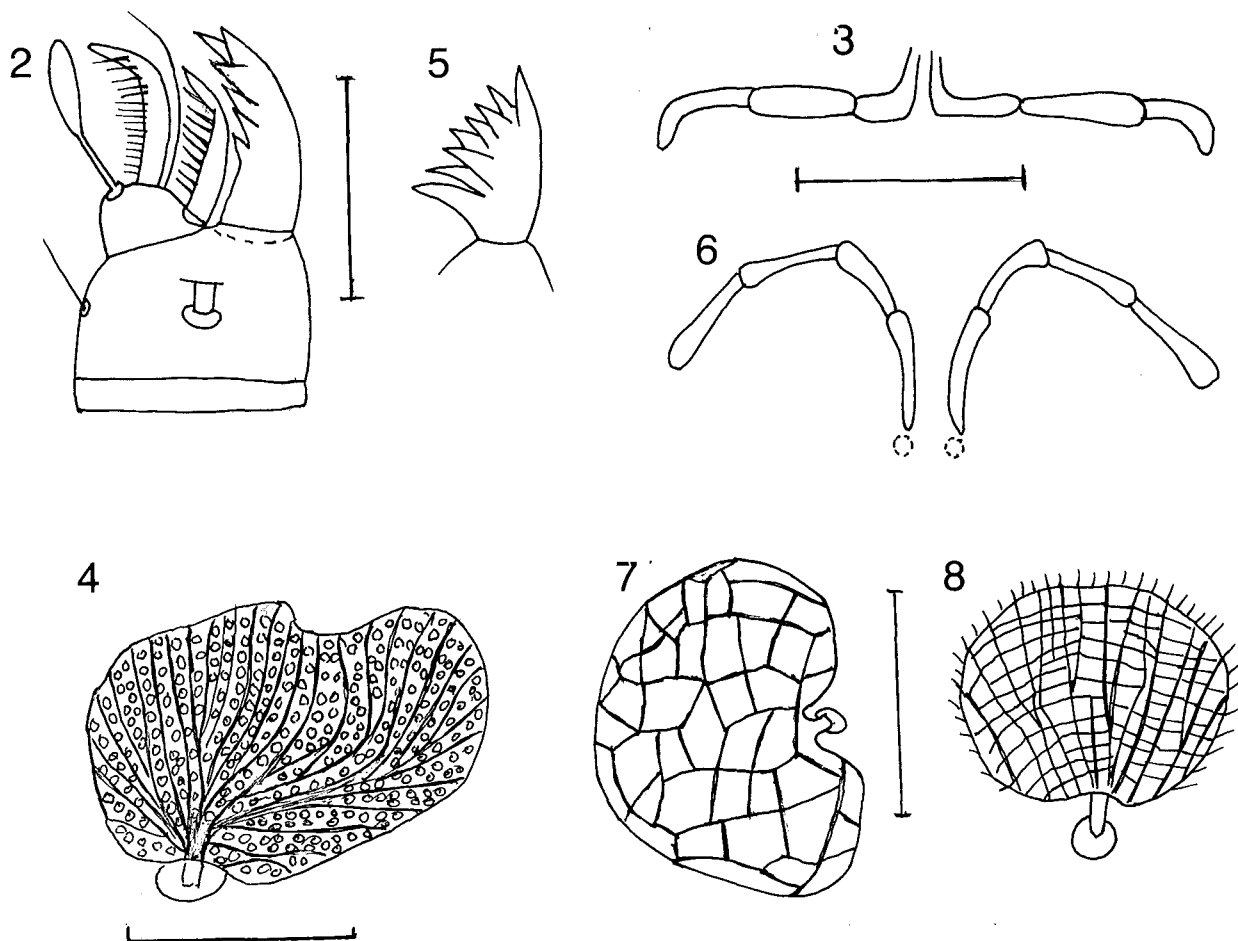


Fig. 1. *Neoeucheyla iranica* sp. n. (female) - dorsum (scale line - 100 μ m).

half of claw. Palptarsus with 2 comblike setae, inner comb with 12-14 teeth, outer comb with 14-16 teeth. Inner part of palptarsus with a short seta (14 long) inflated apically, outer part with a thin seta 22 long. Palptibia bearing a large dorsal clamshell-like seta, concave apically (Fig. 4) and a flabellate ventral seta. Palpgenu without a seta. Palpfemur with 2 ventral and 2 dorsal flabellate setae, among these ventral setae, one ($v1$) median, other lateral ($v2$). Rostral shield distinctly wider than rostrum, with slightly incised anterior margin. Peritreme 57 wide, with 3 pairs of elongate links (Fig. 3), median part curved forward, most lateral links strongly curved backward. Vesicular chambers lacking. **Legs** - Tarsi I-IV 102-82-86-99

long. **Chaetotaxy** (solenidia excluded) -Tarsi I with 10 setae of which 6 preapical (2 long and smooth and 4 shorter of which 2 dorsal thin and barbed and 2 lateral smooth). More basally with 3 thick, setiform, shortly barbed setae, unequal in length and a long (70) squamiform seta on basal third. Tarsi II-IV with 7 setae, pair of very thin apical and long squamiform setae present on tarsus I lacking here. Tibiae I-IV with 2 dorsal flabellate and 2 ventral setae of which 1 flabellate, other long, setiform and shortly barbed. Genua I-IV with 2 dorsal flabellate setae. Femora I-IV with 2-2-2-1 dorsal flabellate setae. **Solenidiotaxy** - A short solenidion (4 to 6 long) present on tarsi I and II, tibia I and genu I.



Figs. 2-4. *Neoeucheyla iranica* sp. n. (female) - 2. palp (tarsus, tibia and genu) in dorsal view, 3. peritreme, 4. dorsal seta of palp-tibia (scale lines - 25 μ m). Figs. 5-8. *Cunlifella bulgarica* (Volgin, 1955) - 5. palp-claw, 6. peritreme, 7. neotrichial modified seta of dorsal shield, 8. seta *ve* (scale lines, Figs. 5 and 6 - 25 μ m, Figs. 7 and 8 - 50 μ m).

Habitat and locality - Holotype female collected from the dust and the grain debris covering the floor of a very large silo that had contained grain of wheat. Locality Karadj, near Tehran, Iran; 35° 45'N, 50° 50'E; alt. 1312 m; Rel. Hum. 58% (June 1998). Holotype in the collection of the Institut royal des Sciences naturelles de Belgique.

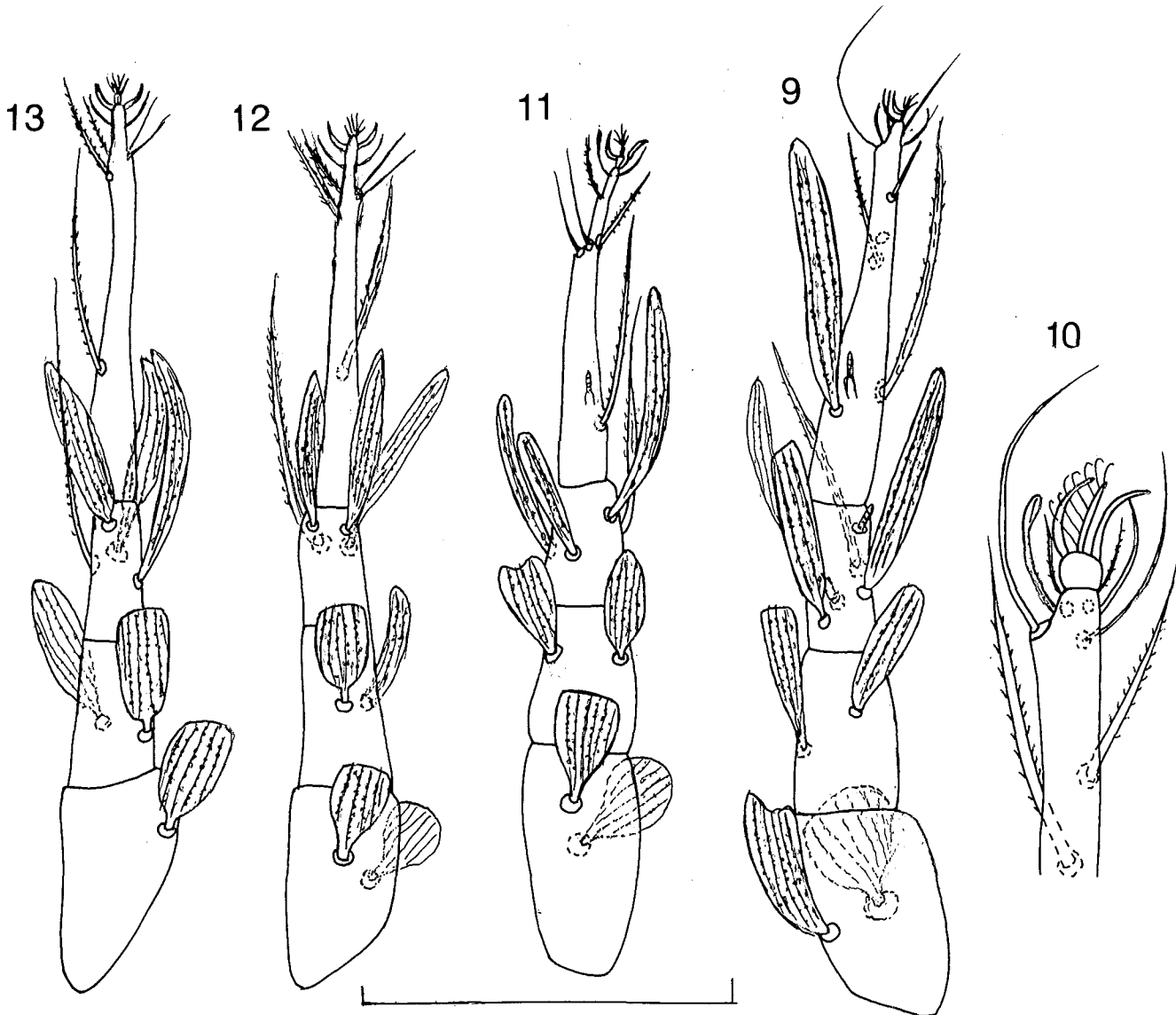
Remarks on the genus *Neoeucheyla* and allied genera

Bochkov and Mironov (1997), have attempted to clarify the status of the 3 allied genera *Neoeucheyla* Radford, *Cunlifella* Volgin and *Bothrocheyla* Volgin, by means of a cladistic method. They analyzed 12 morphological characters in females of the 12 valid species described in these genera. They arrived to the conclusion that *Bothrocheyla* is a valid genus and not a synonym of *Neoeucheyla* as treated by Summers and Price (1970).

They also observed that some characters in these genera, generally considered as important at the generic level, may display a high degree of variability. Such variability was noted, e.g. in the number and the shape of the medio-dorsal setae of the dorsal shields, in the number of teeth on the palpclaw and in the presence or absence of the vesicular chambers. It is worthy of note that the inner sicklelike seta of the palp tarsus in all 3 genera is modified and replaced by a seta inflated apically, whereas in the genus *Cheyletia* Haller, considered as closely related to the 3 genera of the group *Neoeucheyla*, this seta is acicular.

Bochkov and Mironov proposed a cladogram including the following genera and species:

1. *Neoeucheyla* Radford, 1950 - With *N. loricata* (Berlese, 1913) (type species) and *N. minuta* Barilo, 1986.



Figs. 9-13. *Neoeucheyla iranica* sp. n. (female) -9. leg I, 10. apical third of tarsus I, 11. leg II, 12. leg III, 13. leg IV (all legs in dorsal view; scale lines - 100 μ m, excluding Fig. 10).

2. *Bothrocheyla* Volgin, 1964 - This genus had been synonymized with *Neoeucheyla* by Summers and Price, 1970. The authors restored this genus, including *B. pavlovskiyi* Volgin, 1969 (type species), *B. beeri* Thewke and Enns, 1972 and *N. typhosa* (Summers and Price, 1970).

3. *Cunlifella* Volgin, 1969 - With 7 species, among which 4 have vesicular chambers, i. e. *C. tuberculicoxa* Volgin, 1964 (type species), *C. whartoni* (Baker, 1949), *C. panamensis* (Baker, 1949), *C. variegata* (Barilo, 1985) and 3 are devoid of vesicular chambers, i.e. *C. bulgarica* (Volgin, 1955) (Figs. 5-8), *C. mumai* Volgin, 1969 and *C. ornata* (Wafa and Soliman, 1968).

In addition to these 12 valid species, there are 4 other species which were provisionally included in *Neoeucheyla*. These 2 species are known only from female and are inadequately described, i.e. *N. macrocorneus* Soliman, 1975 and *N. ploceus* Gupta and Paul, 1992, and 2 other species are known only from males, *N. maysa* and *N. dua*, both described by Corpuz-Raros, 1998.

Systematic position of *Neoeucheyla iranica*

If we use the 12 characters proposed by Bochkov and Mironov, we note that the new species does not agree completely with any of the 3 genera analyzed by these

authors. It differs from the 2 species of the genus *Neoeucheyla* by the slightly narrower shape of the rostral shield and a different shape of the peritreme. In the 2 species of *Neoeucheyla* (*loricata* and *minuta*), the peritreme is regularly arched and the most median links do not project forward. In *Cunlifella*, the median links are directed backwards forming a M-shaped figure (Fig. 6). In *Bothrocheyla*, and the new species, the peritreme is mostly oriented transversely and straight, the most median links being directed forwards and the lateral links generally abruptly curved backwards (Fig. 3).

The peritremes and 5 toothed palp-claw of *Bothrocheyla pavlovskiyi* (type species) resemble that of *N. iranica* sp. n., however, the peritremes of the latter have less segments and the 5 teeth are very strong and not restricted to the median palp-claw. The main differences are the following: (1) The palptibia in the species of Volgin bears an unusual dorsal seta which is large, broadly foliate (attenuate apically), and strongly bent at its base, and is devoid of ornamentation except on the margin which is finely denticulate. These setae have been described as "brushlike setae" by Bochkov and Mironov, 1997 (Fig. 1a). These dorsal setae in *N. iranica* are clamshell-like, wider than long, reticulate, not bent and with an irregular outline (Fig. 4). (2) The outer sickle-like setae of palptarsus in Volgin's species are bifid while they are simple in the species. (3) The dorsal shields in Volgin's species bear 2 different kinds of setae. The propodonal shield bears 3 pairs of normal setae similar to the lateral setae (they represent the primitive setae *d1* to *d5*) and 3 pairs of neotrichial modified setae. In the new species, only the neotrichial setae are present (Fain *et al.*, 1997). (4) Tibia II in *B. pavlovskiyi* bears 2 hairlike setae and 2 flabellate setae while in the new species this tibia bears 1 hairlike and 3 flabellate setae. (5) The palpgenu in *B. pavlovskiyi* bears a ventral flabellate seta. This seta is lacking in *Neoeucheyla*, *Cunlifella* and the new species.

The study of the Russian authors has shown that the genus *Bothrocheyla* should be restored as a valid genus. We agree with this conclusion.

Concerning the generic and specific status of the new species, it appears that it does not agree completely with any of the 3 genera studied here. However, we think that it is closest to the genus *Neoeucheyla* but may belong to a new genus.

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