

# ERYTHRAEUS MIRJAVEHI N. SP. (ACARI, ACTINEDIDA, ERYTHRAEIDAE) FROM IRAN WITH REMARKS ON THE GENUS PARERYTHRAEUS

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TAXONOMY  
SYNONYMY  
ERYTHRAEIDAE  
IRAN

SUMMARY : *Erythraeus mirjavehi* n. sp. (adult, female) collected in the gravel desert near Mirjaveh (Iran) at the Iran-Pakistan border is described. The genus *Parerythraeus* Southcott, 1946 is synonymized with the genus *Erythraeus* Latreille, 1806. All the species described within *Parerythraeus* hitherto, are specified as new combinations.

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RÉSUMÉ : On décrit *Erythraeus mirjavehi* n. sp. (adulte, femelle) ramassés sur le désert de gravier dans les environs de la frontière irano-pakistanaise près du village Mirjaveh (Iran). On synonymise le genre *Parerythraeus* Southcott, 1946 avec le genre *Erythraeus* Latreille, 1806. Toutes les espèces du genre *Parerythraeus* décrites jusqu'à nos jours sont spécifiées comme de nouvelles combinaisons.

The genus *Erythraeus* was erected by LATREILLE in 1806 together with the type species *Acarus phalangoides* de Geer, 1778 (by original designation). SOUTHCOTT (1946) created the monotypic genus *Parerythraeus* basing on the type species *Parerythraeus gregoryi* Southcott, 1946. In further work (SOUTHCOTT, 1961) he included also *Parerythraeus tragardhi* (= *Erythraeus Dugesi* Trägårdh, 1904a non *Erythraeus Dugesi* (Lucas, 1846)) in this genus.

The definitions of *Erythraeus* and *Parerythraeus* given by SOUTHCOTT (1961) are similar and differ fundamentally in one point referring to the construction of leg setae : *Erythraeus* : "... Legs without modified serrate setae (serratae)"; *Parerythraeus* : "... legs with a clothing of asymmetrically serrate setae distally as far as the middle of genua, and a

few on tibiae (metatarsi) proximally". SOUTHCOTT, in the above work, adduced the descriptions made by TRÄGÅRDH (1904b pp. 59-61) and SCHWEIZER (1951 p. 124) regarding them as the best of the type species of *Erythraeus* — *E. phalangoides*. Unfortunately, none of them contained figures of leg setae of the described species. Only in the later published work (SCHWEIZER and BADER, 1963) in the page 273 we can find a figure of *E. phalangoides* and a magnified leg seta constructed as a typical serrata! (on tibia). Also my studies point out that all the specimens of *E. phalangoides* collected in Poland have "highly modified serrate setae" which may occur on every leg. There are also several intermediate forms between a straight seta and a highly modified seta in one specimen.

The opisthosomal and leg setae in several species

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of *Erythraeus* and also in species described within *Parerythraeus* show a great variability in structure. There are some relatively straight, long, and smooth as in *E. glabrisetosus* Willmann, 1953, and, through intermediate forms, the short and densely pilose as on opisthosoma of *E. plumosus* Khot, 1963 (the leg ones unchanged!) or highly modified (serratae) as on legs in *E. phalangoides* (de Geer, 1778) or *E. dubiosus* Schweizer, 1951 (SCHWEIZER and BADER, 1963). Proportions of the body also vary so there is no significant character differentiating these two genera, and, moreover, the definition of *Parerythraeus* comprises all characters of *E. phalangoides* — the type species of *Erythraeus*.

According to these the genus *Parerythraeus* Southcott, 1946 appears a synonym of *Erythraeus* Latreille, 1806.

There have been described six species within *Parerythraeus* hitherto, i.e. : *Erythraeus gregoryi* (Southcott, 1946) comb. nov., *Erythraeus tragardi* (Southcott, 1961) comb. nov., *Erythraeus delhiensis* (Khot, 1963) comb. nov., *Erythraeus serraticiliatus* (Khot, 1963) comb. nov., *Erythraeus indicus* (Khot, 1963) comb. nov., *Erythraeus elegans* (Khot, 1963) comb. nov. The last four were described by KHOT (1963) under the name of *Paraerythraeus* (*lapsus calami*).

The diagnosis presented below is based in a great part on the definition of SOUTHCOTT (1961).

#### GENUS *ERYTHRAEUS* LATREILLE, 1806

*Erythraeus* LATREILLE 1806 : 146.

*Parerythraeus* SOUTHCOTT 1946 : New synonym.

Definition : Moderately large erythraeid mites with two eyes on each side. Crista metopica present, normal. The palpi carry distally and ventrally (i.e. along the flexor edge) a series of stout conical spines (conalae) derived from modified setae, these being present on the palptibia and palpgenu. The palpal tarsus is pear- or club-shaped, overreaching the palpal tibial claw. Legs I-IV with setae of different kind, i.e. straight, little or highly modified. Cosmopolitan; it occurs in Holarctic,

Ethiopian, Oriental, Neotropical and Australian Regions.

Type species : (Original designation) : *Acarus phalangoides* de Geer, 1778 p. 134.

#### *Erythraeus mirjavehi* n. sp.

##### FEMALE

Terminology after SOUTHCOTT (1961).

Body oval, 2 265 long \*, 1 420 wide, covered with setae rather densely (fig. 1).

Dorsal setae uniform, asymmetrical, 40-50 long, pineal (strobiliform) dorsally and leaflike laterally and ventrally, regularly pilose on the whole surface (figs. 10a, b, c). Ventral side with a conspicuous keel running along the seta and contracting in its apical part (fig. 10a).

Crista metopica very long (850) with two sensillary areas, anterior and posterior one, both triangular in outline. The apex of the anterior sensillary area with 5 long and stout (180-320 long) nonsensillary setae (scutalae) and 2 slender and elongate sensillary setae (sensillae) about 310 long. On the posterior sensillary area there are also two sensillae about 210 long (fig. 3).

Double eyes situated on the right and left side closely to the edges of the body, in half distance between the middle of crista metopica and its posterior sensillary area (equally to coxae II) (figs. 1, 4).

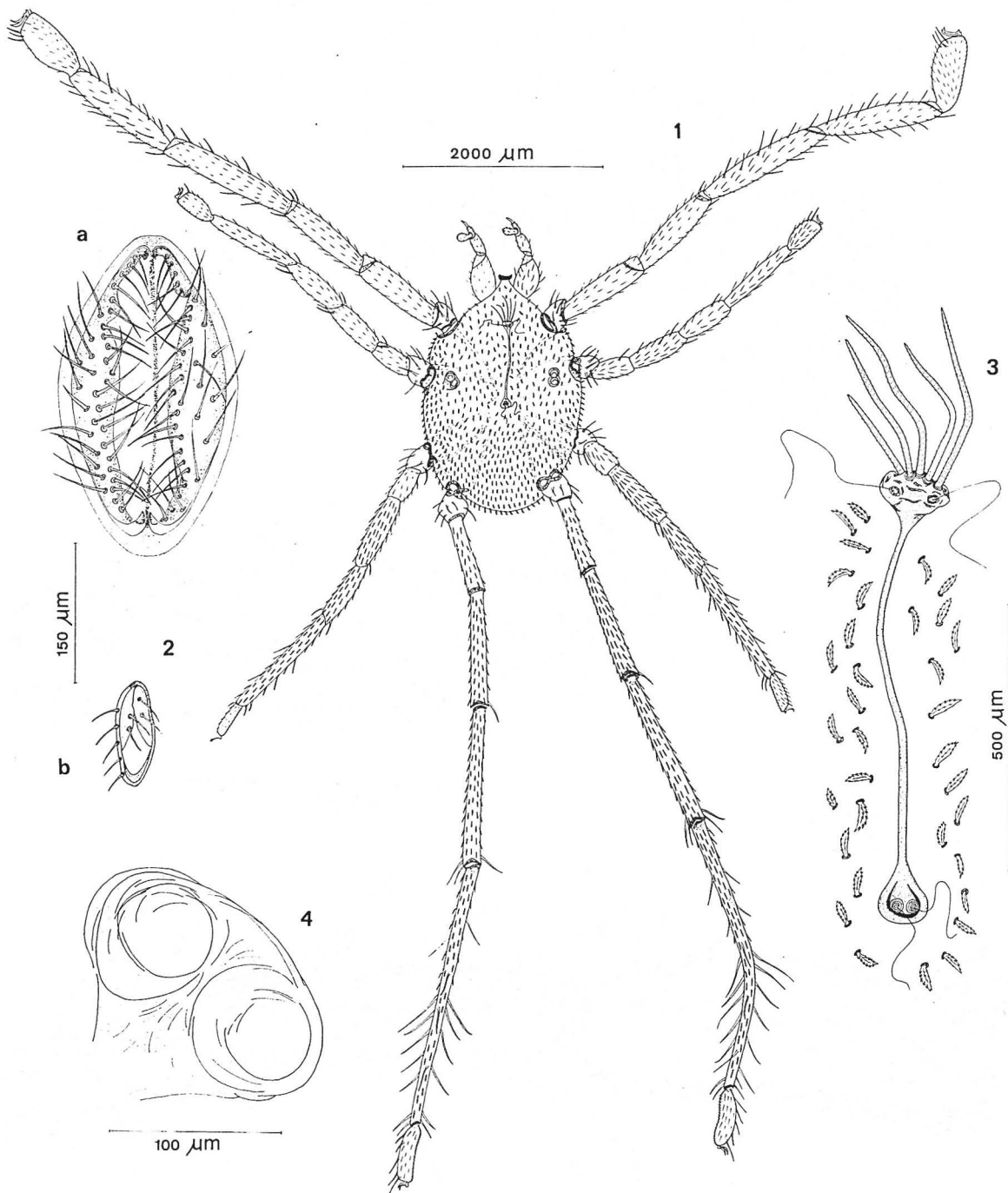
Chelicerae dagger-shaped. 1 230 long, formed typically as in the genus *Erythraeus*.

Palps typical of *Erythraeus*, of the following dimensions (length and width respectively) : palpfemur 404, 246; palpgenu 272, 125; palptibia 184, 75; palptarsus 200, 75. Palptarsus clavate. Both palps with equal number of conalae : palptibia 6, palpgenu 2 (+ 3 poorly developed). Palptibial conalae 30 long, and palpgenual 40 long (fig. 5).

Ventral setae uniform, otherwise formed than those on dorsum; elongate (60-100 long), with soft and regular pilosity (fig. 9).

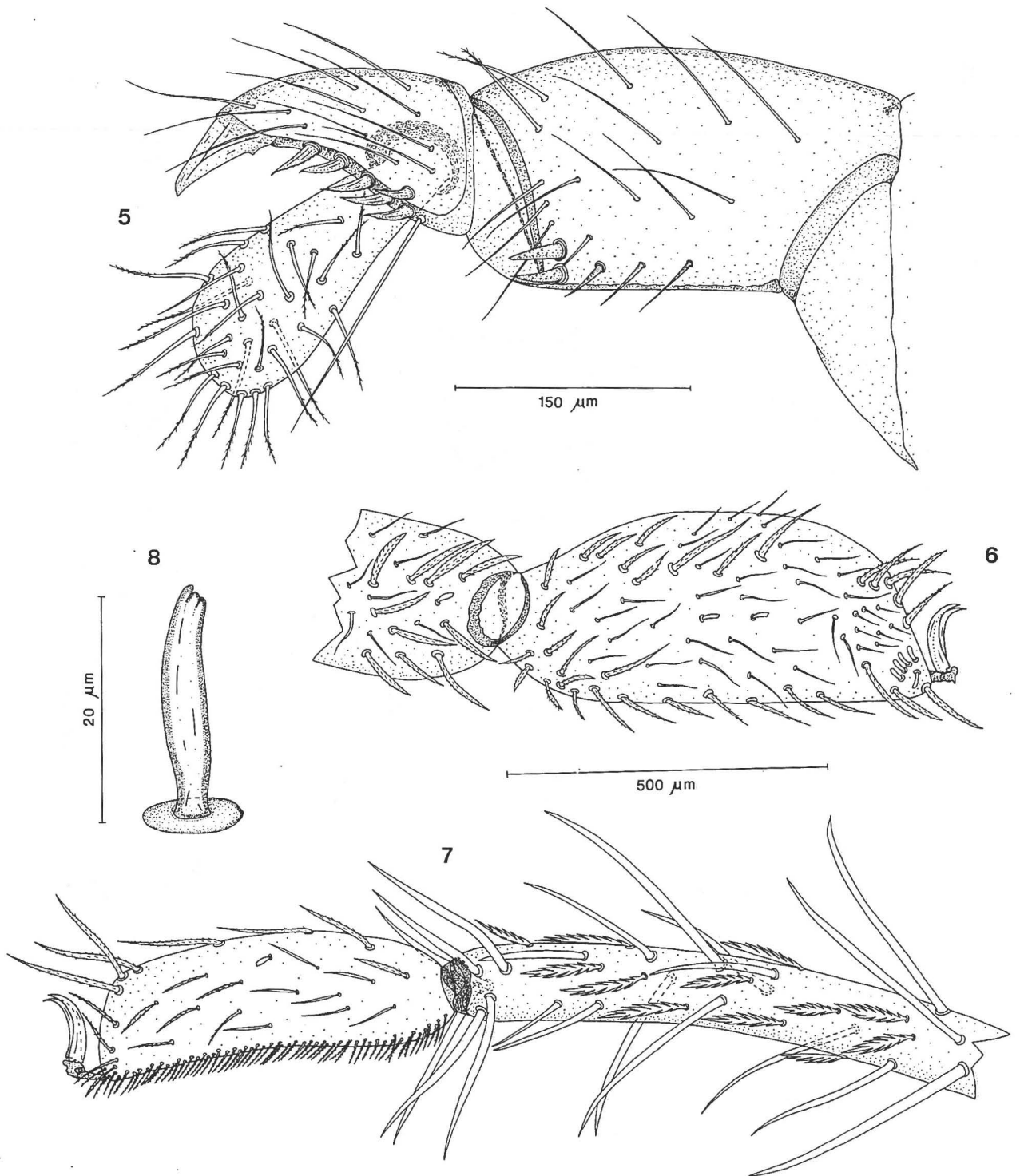
Genital opening (385 long, 220 wide) shaped typically of the female (after TURK and SCHUSTER,

\* All dimensions in  $\mu\text{m}$ .



FIGS 1-4 : *Erythraeus mirjavehi* n. sp.

1. — Dorsal view. 2. — Genital region : (a) genital opening, (b) uropore. 3. — Crista metopica. 4. — Eye pair.



FIGS 5-8 : *Erythraeus mirjavehi* n. sp.

5. — Right palp (tarsus, tibia and genu), medial (= internal) view. 6. — Right tarsus (and part of tibia) I, posterior view. 7. — Left tarsus (and part of tibia) IV, posterior view. 8. — Sensala ("small thumblike sensillary seta") similar to bothriala or vestigiala.

1983). Outer valvae narrow, the inner broad, both densely pilose (fig. 2a).

Uropore 122 long, 46 wide (fig. 2b).

Legs relatively long, densely covered with setae of different length 60-330 (figs. 11-16). Serrate setae are very characteristic. They are developed to the different degree on different legs; legs III and IV have the most developed serratae and the legs I the poorly developed ones ("semiserratae") (figs. 6, 7, 12a, b, 13). The very long (up to 330), feebly pilose and stout mastalae are also characteristic and best formed on tibia and genu IV (figs. 1, 7, 16). They form a kind of spur. Spinalae (fig. 11) and variously transformed scobopedalae (figs. 14, 15) are also present, Epimera (coxae) of all legs very well developed, elongate, almost adjoining at the region of the posterior sensillary area of crista metopica. Trochanters short, acetabular with well shaped, long and stout trochanteralae. Tibia II, III and particularly IV considerably longer than other articles (fig. 1). Tarsi terminated by two claws and covered with various setae. Ventral side with numerous, short and dense setae which form a "brush". There are also some scobalae, spinalae and tactalae (figs. 6, 7). We can also observe some characteristic little setae (20) (sensalae) similar to vestigialae or bothrialae, defined by KHOT (1963) as "small thumb-like sensillary setae". Their number and distribution is as follows: tarsus I 7, tarsus II 2, tarsus III 1, tarsus IV 1, tibia I 1, tibia II 1. They are all situated posteriorly (figs. 6, 7, 8).

Leg dimensions (length of coxa, trochanter, basifemur, telofemur, genu, tibia, tarsus, and the whole respectively): I: 660, 277, 847, 878, 1 355, 1 124, 693, 5 834; II: 550, 216, 340, 554, 570, 862, 370, 3 462; III: 590, 262, 431, 693, 708, 1 232, 354, 4 270; IV: 700, 246, 780, 1 340, 1 355, 2 526, 580, 7 527. Breadth of tarsus I 308, II 154, III 139, IV 154.

Male, nymph, and larva not known.

*Etymology*: the name of the species has been derived from the name of place of collection.

#### *Collection data*

One specimen of *Erythraeus mirjavehi* n. sp. has been collected during the Biological Expedition to Iran and Pakistan organized by the Department of

Biology and Environment Protection of the Silesian University in Katowice. The specimen was caught the night from 3 to 4 of August 1984 with a use of the "white sheet", in the gravel desert near Mirjaveh (Iran), several dozen kilometers south of Zahedan.

Holotype: adult female collected on Aug. 3 1984; the specimen mounted in polyvinyl-lactophenol is deposited in the author's collection (AS/IRAN/1).

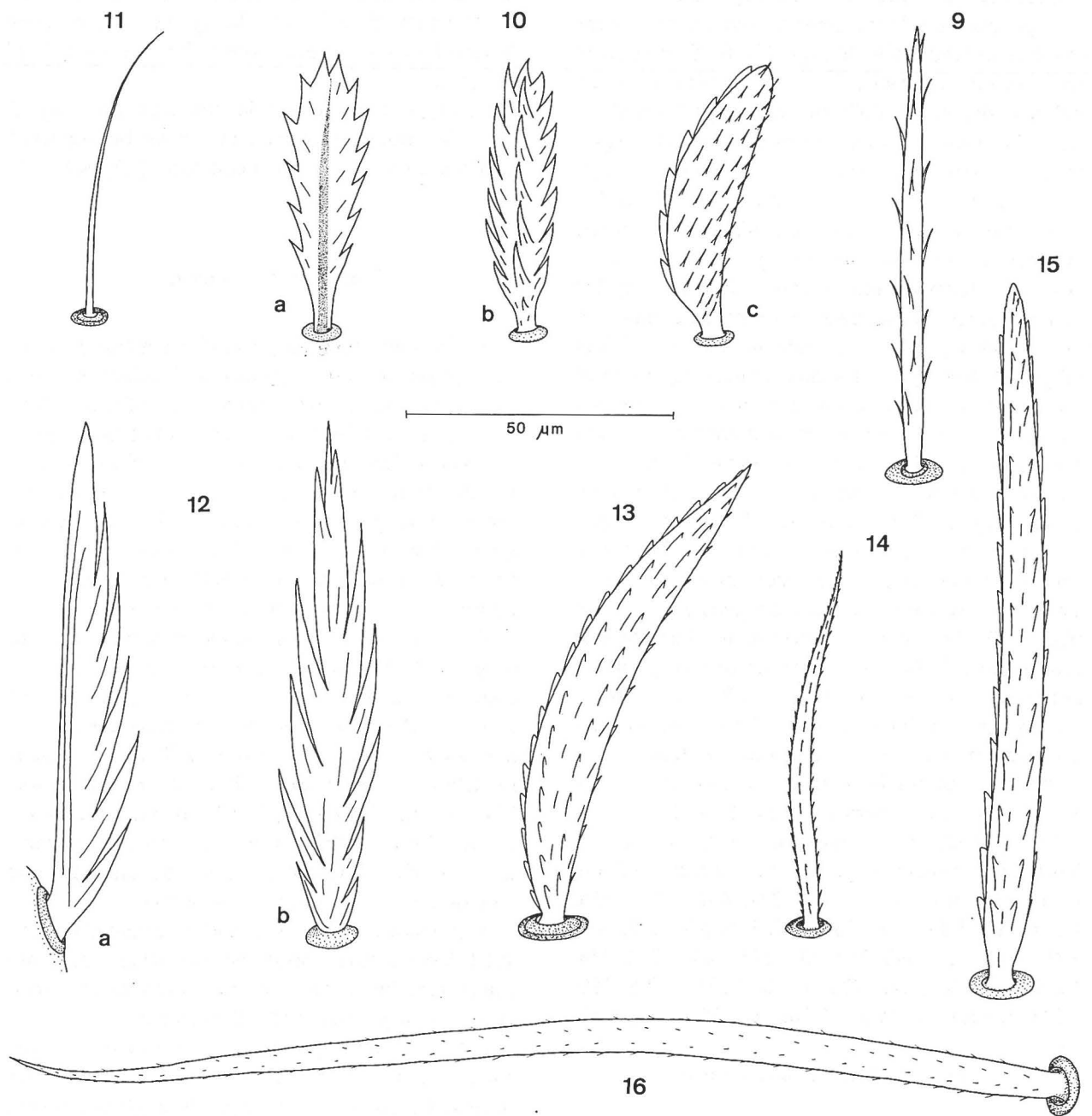
#### REMARKS ON TAXONOMY

As for now, there is no uniform method of the description of both nymphs and adults of Erythraeidae. Usually, we consider a set of descriptive, metric, and meristic characters. However, in spite of some difficulties (the variability of metric and meristic characters), relating to the mass data and a precise description, the differences between several species appear very clear. *Erythraeus mirjavehi* n. sp. differs from previously described species in a number of characters presented below.

*E. mirjavehi* n. sp. is distinctly separated from other Holarctic species and from some Oriental ones by the structure of dorsal (opisthosomal) setae. At the same time this character nears it to five Oriental species: *E. plumosus* Khot, *E. orientalis* Khot, *E. delhiensis* (Khot), *E. serratociliatus* (Khot), and *E. indicus* (Khot); to one Ethiopian: *E. nigrיתיensis* André; to one Palearctic-Ethiopian: *E. tragardhi* (Southcott); and, at last, to one Australian: *E. gregoryi* (Southcott).

*E. plumosus* Khot, 1963 and *E. orientalis* Khot, 1963 have similar opisthosomal setae but differ fundamentally in lack of specialized setae (serratae) on legs, and body dimensions.

From the description of *E. nigrיתיensis* André, 1962 it appears that this species also does not possess serratae on the legs, although the author says that some leg setae may be "barbulées ou denticulées". But none of the figures allows one to state that this character is as strongly developed as serratae in *E. mirjavehi* n. sp. It was also pointed by KHOT (1963) while comparing *E. nigrיתיensis* to *E. plumosus* which lacks "modified serratae setae".



FIGS 9-16 : *Erythraeus mirjavehi* n. sp.

9-10. — Body setae : 9. — Ventral seta. 10. — Dorsal seta : (a) ventral view, (b) dorsal view, (c) lateral view. 11-16. — Leg setae : 11. — Spinala. 12. — Serratala : (a) lateral view, (b) dorsal view. 13. — "Semiserratala". 14, 15. — Different kinds of scobopedalae. 16. — Mastala.



*E. nigritiensis* is characterized also by different proportions in legs : leg I : body length = 4 : 1, tibia IV : tibia I = 1,4 : 1, tibia I : tarsus I = 3,2 : 1, tibia IV : tarsus IV = 5,5 : 1 (in *E. mirjavehi* : 2,5 : 1 ; 2,2 : 1 ; 1,6 : 1 ; 4,3 : 1 respectively). Other characters (length of crista metopica, number of nonsensillary setae as well as conalae, etc.) allow one to think about a certain relation between these two species.

*E. serratociliatus* (Khot, 1963) differs evidently in size of the body. It is twice smaller (1 053 in length) and has considerably shorter legs. It has 3 nonsensillae and on palptibia 3 conalae while on palpgenu there is none. Crista metopica is extremely long (871) and in comparison with other parts of the body it appears as follows : length of the body : length of crista metopica = 1,2 : 1, leg I : crista metopica = 2,25 : 1, leg IV : crista metopica = 3,1 : 1 (in *E. mirjavehi* : 2,7 : 1 ; 6,75 : 1 ; 8,85 : 1 respectively).

The proportions of well sclerotized structures as crista metopica and legs seem to characterize the mite properly whereas the ratios of length (or width) of the body to other structures may appear unreliable in consideration of the different degree of filling with the feed (see SOUTHCOTT, 1961, pp. 397-399).

The last considerable character differing *E. mirjavehi* from *E. serratociliatus* appears in the construction of serratae. In the last species they are blunt with rounded cup-like setations.

*E. delhiensis* (Khot, 1963) is greater (3 250 in length); its body is square in outline and has relatively shorter legs (their absolute lengths are close to *E. mirjavehi*). The fundamental differences appear in the number of nonsensillae (12), conalae on palpgenu (6-7), and the construction of serratae which have more rounded and blunt serration.

*E. indicus* (Khot, 1963) resembles *E. mirjavehi* sensibly in shape and proportions of the body, but is far smaller (1 420 in length). On palptibia there are only 3 conalae and the shape of dorsal setae is a little different — they are less asymmetric. The significant difference refers to the size of crista metopica which is very short (364) in *E. indicus*, and its relations to the other parts of the body

stand as follows : length of the body : length of crista metopica = 3,9 : 1, leg I : crista metopica = 10 : 1, leg IV : crista metopica = 12,8 : 1 (in *E. mirjavehi* : 2,7 : 1 ; 6,75 : 1 ; 8,85 : 1 respectively). Other characters, as number of nonsensillae or structure of serratae close this species to *E. mirjavehi*.

*E. gregoryi* (Southcott, 1946) is a little greater and has longer legs. The essential distinction is observed in the number of nonsensillae (10), and proportions of some parts of the body : leg I : crista metopica = 8,9 : 1, leg IV : crista metopica = 12,7 : 1, tibia I : tarsus I = 2,5 : 1 (in *E. mirjavehi* : 6,75 : 1 ; 8,85 : 1 ; 1,6 : 1 respectively). Also serratae are formed in a different way ; their denticles at the base are considerably broader and resemble rather an equilateral triangle in outline ; they are not mucronate contrary to *E. mirjavehi*.

*E. tragardhi* (Southcott, 1961) is similar to *E. mirjavehi* in length of the body but has apparently shorter legs (legs II and III are shorter than the body !). The ratio of several legs to the length of the body is as follows : I 1,4 : 1 ; II 0,8 : 1 ; III 0,9 : 1 ; IV 1,7 : 1 (in *E. mirjavehi* : 2,3 : 1 ; 1,3 : 1 ; 1,6 : 1 ; 3,0 : 1 respectively). In both cases the length of coxae has not been considered. Crista metopica has 10 nonsensillae. Unfortunately, the length of crista metopica has been omitted in the original description (TRÄGÅRDH, 1904a). However, there is an important information, that it has a process ("Fortsatz") projected forward and running from the anterior sensillary area. Such a process is not present in *E. mirjavehi*. Palptarsus is cylindrical, not clavate as in *E. mirjavehi*. Serratae are also differently constructed : they do not possess a conspicuous broadening in the middle of seta, they are rather obtuse, the incisions in the denticles are shallow, the denticles are short.

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