



## A review of the subgenus *Asiochirus* FAIN, 1970 (Acari Listrophoridae)

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### Summary

The subgenus *Asiochirus* FAIN, 1970 is revised. Two new species are described: *A. soriculus* sp. n. from *Soriculus leucops* and *A. nepalensis* sp. n. from *Soriculus caudatus* (Soricidae). *Asiochirus sinensis* FAIN, 1970 and *A. crocidurae* FAIN, 1976 are transferred into the genera *Spalacarus* FAIN, 1980 and *Olistrophorus* MCDANIEL & WHITAKER, 1972, respectively. The subspecies *A. suncus montanus* is synonymized with *A. suncus suncus*. The genus *Asiochirus* contains now four species, all described from Soricidae. A new diagnosis is given for this genus and keys to males and females are provided.

**Keywords:** Listrophoridae. *Asiochirus* s.str. Shrews. Soricidae. Systematic.

### Introduction

Mites of the family Listrophoridae (Acari Astigmata) are permanent, highly specialised, mono- or oligoxenous ectoparasites living in the fur of small mammals. The genus *Asiochirus* FAIN, 1970 was revised by FAIN (1978) who included in this genus eight species associated with shrews of the family Soricidae and rodents from the families Cricetidae (Myospalacinae) and Platacanthomyidae. In this same paper he synonymised the genus *Olistrophorus* MCDANIEL et WHITAKER, 1972 (type species *O. cryptotae* MCDANIEL et WHITAKER, 1972) with *Asiochirus*.

In 1981, FAIN restored the genus *Olistrophorus* and included in this genus four species: *O. cryptotae*, *O. blarinae* (FAIN et HYLAND, 1972), *O. guatemalensis* (FAIN, 1978) and *O. platacanthomys* (FAIN, 1970). These species differed from *Asiochirus suncus* (RADFORD, 1940) (type species of *Asiochirus*) mainly by the presence in the males of a median transverse pregenital sclerite joining the epimera III. Such sclerite is lacking in the males of *A. suncus* and *A. chimarrogale* FAIN, 1976. Another character also observed in males is the degree of development of the adanal suckers which are poorly or very poorly developed in the four species of *Olistrophorus* and well developed in the two species of *Asiochirus* (see FAIN, 1981a, pages 309 and 311).

During a stay in the Museum of natural History (London) some years ago, the senior author

collected two new species of mites of *Asiochirus* from Insectivores of the genus *Soriculus* (mountain shrews, Soricidae) i.e. *Asiochirus soriculus* sp.n. and *A. nepalensis* sp.n. These species are described here.

Two other species of *Asiochirus* only represented by female specimens had been included only provisionally in this genus: *A. sinensis* FAIN, 1970 from *Myospalax pusillus* and *A. crocidurae* FAIN, 1976 from *Crocidura hodgsoni*. A reexamination of *A. sinensis* has revealed that this species is very close to *Spalacarus spalacis* (FAIN, 1970), the type species of the genus *Spalacarus* FAIN, 1980 and we included therefore *A. sinensis* in the genus *Spalacarus* (see FAIN, 1981b).

The female of *Asiochirus crocidurae* belongs to the genus *Olistrophorus* because the suboval shape of it's body and the characteristic shape of the anterior margin of the propodosomal shield.

Recently, FAIN and ESTEBANES (1996) described two new species of mites collected from *Sorex* sp. (Soricidae) in Mexico. A new subgenus of *Asiochirus* was created i.e. *Asiochirus (Mexicochirus)*, to contain these species.

In the present paper we provide a new definition of the subgenus *Asiochirus* and describe two new species, increasing the number of valid species in this subgenus up to four.

## Material and Methods

The nomenclature of the idiosomal setae follows FAIN (1965). All measurements are in micrometers ( $\mu\text{m}$ ).

Specimens examined in the present study are deposited in the Institut royal Sciences Naturelles Belgium, Bruxelles (IRSNB), the Museum of Natural History, London (MNH) and in the Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia (ZISP).

The Latin names of host genera and species are given according to WILSON and READER (1992).

## Descriptions

FAMILY **Listrophoridae** MEGNIN & TROUËSSART, 1884

SUBFAMILY **Listrophorinae** MEGNIN & TROUËSSART, 1884

GENUS **Asiochirus** FAIN, 1970

## Diagnosis

*In both sexes.* With the general characters of the family. Body elongate. Anterior margin of propodosomal shield rounded, with small median prolongation directed anteriorly and without lateral incisions. Chaetotaxy of idiosoma: *sci*, *sce*, *d1-d5*, *l1-l5*, *h*, *sh*, *a1-a3*, *cxI*, *cxIII*, *gm* and *gp*.

*Female.* There are only 2 shields present on dorsum, a propodosomal and a postscapular. Postscapular shield well developed but shorter than the propodosomal, its posterior margin not reaching the level of the bases of setae *d2* and covered with transversal dark lines. Opisthogaster striated transversally, with scales. Copulatory orifice situated dorso-terminally.

*Male.* Propodonotal, postscapular and hysteronotal shields not divided. Absence of a median transverse pregenital sclerite. Posterior extremity of the body rounded, lobes not developed. Setae *l5* hair-like. Penis relatively long and simple (Fig. 2). Adanal copulatory suckers present, well developed. Legs III and IV subequal in size. All setae of tarsi IV hair-like, not modified.

Type species: *Listrophorus suncus* RADFORD, 1947

Species included: *A. chimarrogale*, *A. soriculus* sp. n. and *A. nepalensis* sp. n.

*Differential diagnosis.* This genus is closely related to the genus *Olistrophorus* and differs from this genus by the following characters. In both sexes of *Asiochirus*, the body is elongate; the

anterior margin of the propodosomal shield is widely rounded and devoid of lateral incisions; in the male, the genital suckers are well developed and the penis is relatively long and has a simple structure (Fig. 2). In both sexes of *Olistrophorus*, the body is suboval; the anterior margin of the propodosomal shield is mushroom-like in shape, with large rounded lateral incisions; in the male, the genital suckers are poorly developed or strongly reduced and the penis is short or has a complicate structure.

All the species of this genus are exclusively associated with insectivores of the family Soricidae.

### 1. *Asiochirus suncus* (RADFORD, 1947)

*Listrophorus suncus* RADFORD, 1947: 234, figs. 7-8.

*Asiochirus suncus*, FAIN, 1970: 275; 1978: 390, figs. 1-2.

*Asiochirus suncus montanus* FAIN, 1978 syn. n.: 390-393, figs 3-5.

*Type material:* Lectotype male of *A. suncus* from *Suncus murinus* (L. 1758) (= *S. caeruleus giganteus*), Colombo, Ceylon. This specimen is deposited in MNH. Holotype male, 3 female paratypes of *A. suncus montanus* from *S. murinus* (= *S. caeruleus montanus*), Ceylon, 1971 (Coll. A. FAIN). These specimens are deposited in MNH.

*Additional material:* 2 males and 2 females from the type host species (= *Pachyura luzoniensis*), Malabon, Luzon, IV.1908 (Coll. CARPENTIER) (IRSNB).

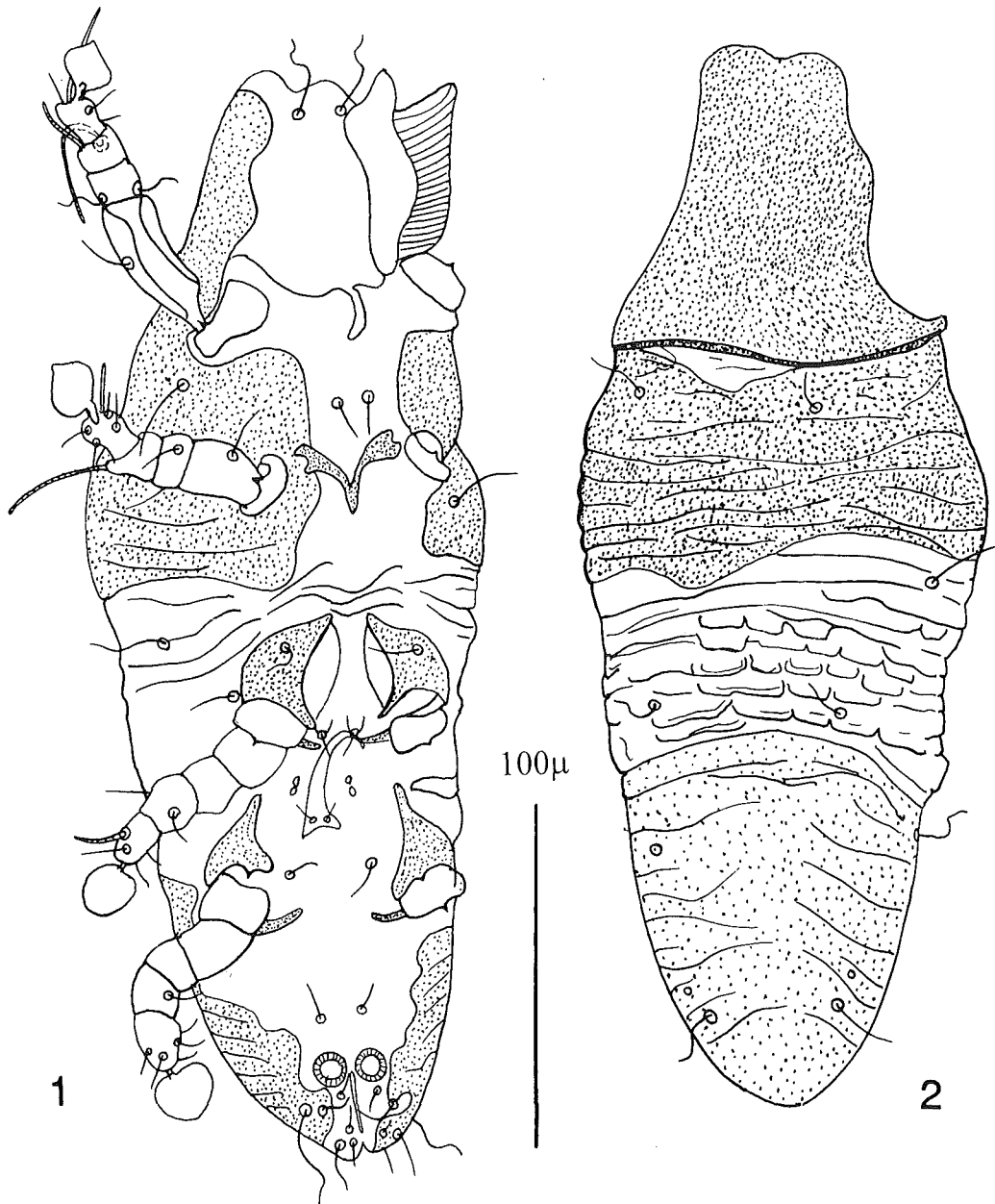
*Remarks.* The holotype of subspecies *A. suncus montanus* FAIN, 1978 (male) is distinguished from the lectotype of *A. suncus* by small, probably not significant differences in measurements (FAIN, 1978). However, we think now that *A. suncus montanus* syn. n. is a junior synonym of the typical form.

### 2. *Asiochirus chimarrogale* FAIN, 1976

*Asiochirus chimarrogale* FAIN, 1976: 39; 1978: 397, figs. 14-15.

*Type material:* Holotype male, 4 male and 4 female paratypes from *Chimarrogale himalayica* (GRAY, 1842) (Soricidae) Mont Carin, Birmanie (Coll. A. FAIN). The holotype and part of paratypes are deposited in MNH; other paratypes in IRSNB.

*Additional material:* One male and 4 females from the type host species, Darjeeling, India. One male and 6 females from *Nectogale elegans*



Figs 1-2. *Asiochirus soriculus*, n. sp., male. Ventral view (1) and dorsal view (2). Scale line 100  $\mu$ m.

MILNE-EDWARDS, 1870 (Soricidae), Moupin, Chine (Coll. F. LUKOSCHUS) (IRSNB).

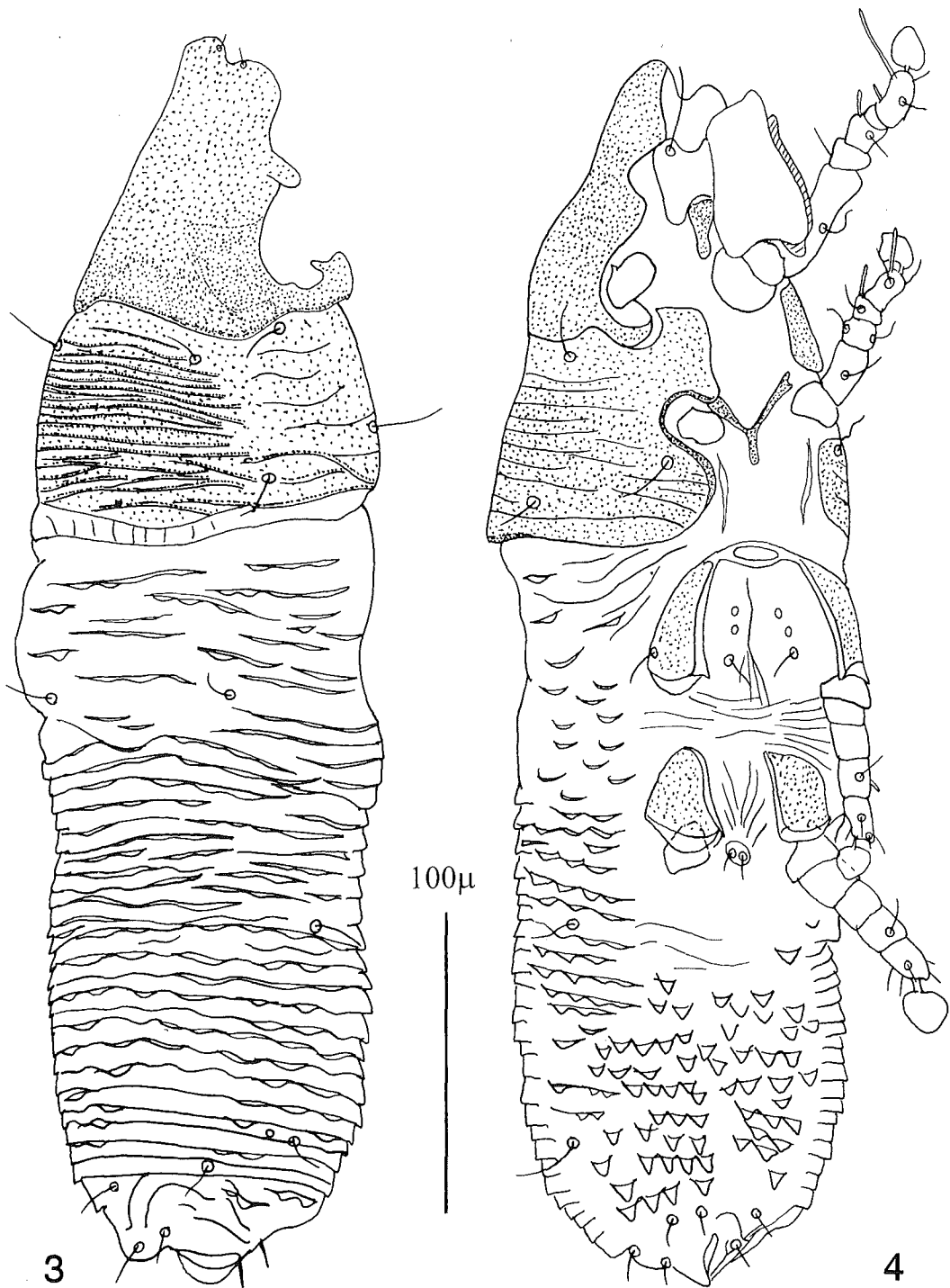
3. *Asiochirus soriculus* n. sp.

*Type material*: Holotype male, 6 male and 6 female paratypes from *Soriculus leucops* (HORSFIELD, 1855) (Soricidae), Mt. Fan, Si Pan, Annam, 16.XII.1929 (Coll. DELACOUR). Host housed in MNH, London. The holotype, 3 male and 3 female paratypes are deposited in MNH. 2 male and 2 female paratypes in IRSNB and one male and one female paratypes in ZISP.

*Additional material*: 2 females and one male from *Soriculus baileyi* (Soricidae), Mt. Fan, Si Pan,

Chapa Tonkin, 16.XII.1929 (Coll. DELACOUR).

*Male* (holotype) (Figs 1-2). Body length, including gnathosoma, 315 (315-325), width 115 (110-115). *Dorsum*. Propodosomal shield 90 (90-100) long in midline. Postscapular shield 55 (55-75), covered with 6-7 transversal interrupted lines. Hysteronotal shield 100 (95-100) long, entire, weakly sclerotized and without ornamentation. Space between postscapular and hysteronotal shield covered with striate cuticle, about 10-11 interrupted lines. *Venter*. Penis about 35-40 long. Setae *ls* 25 (20-25) long. Transversal sclerites behind the coxae III (projections of the coxae III fields) well developed, but not fused to each other.

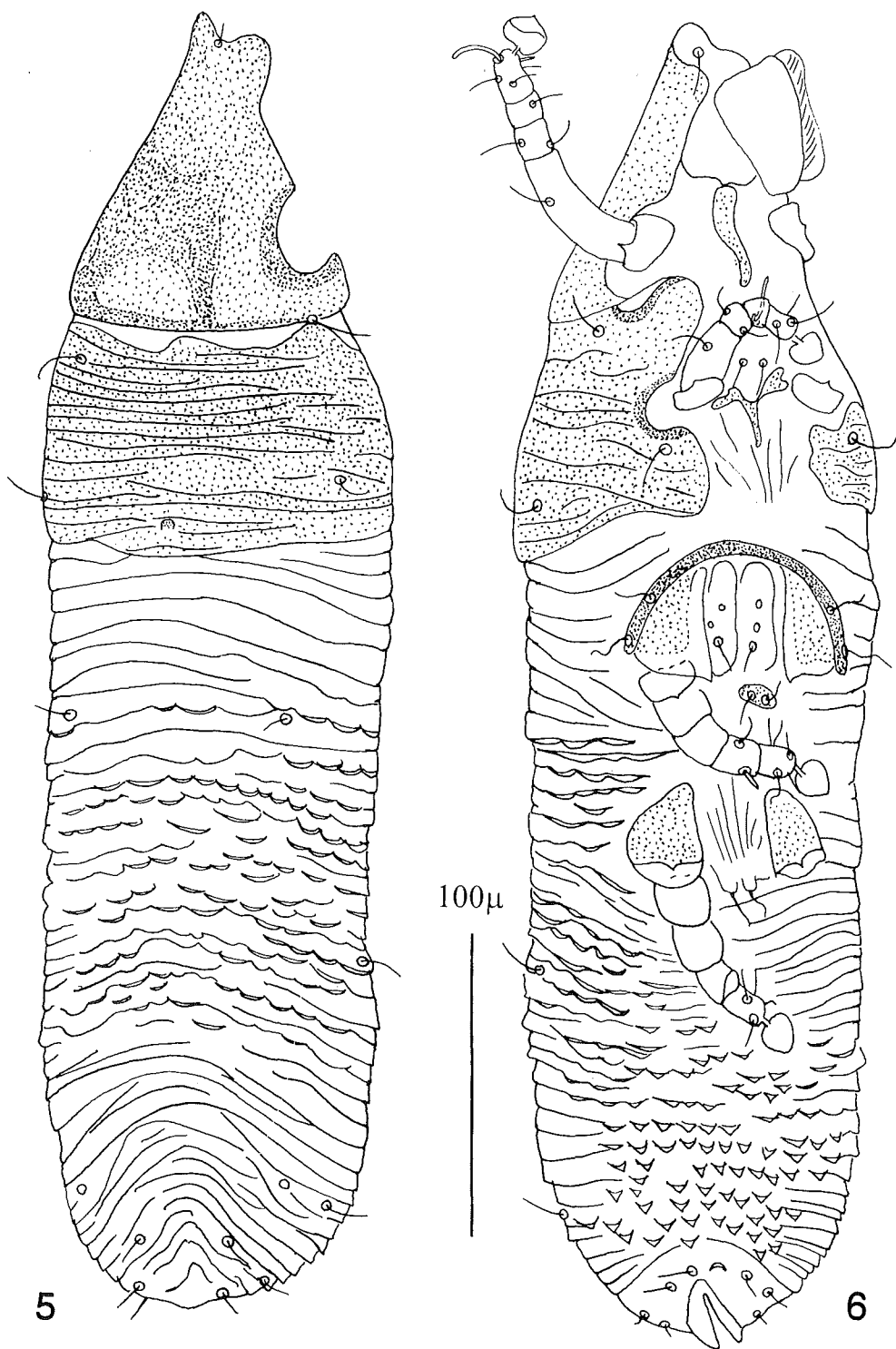


Figs 3-4. *Asiochirus soriculus*, n. sp. Female in dorsal view (4) and ventral view (5). Scale line 100  $\mu$ m.

Adanal suckers well developed. *Legs*. Solenidion of tibia I 26 (25-28), solenidion omega 1 of tarsi I 10 (9-11) long, omega 3 26 (25-26) long.

*Female* (Figs 3-4). Body length, including gnathosoma, 415-425 (in 10 paratypes), width 110-115. *Dorsum*. Propodosomal shield 65-75 long in midline. Postscapular shield 90-100 long, covered with 10-12 transversal thick interrupted

lines. The cuticle behind the postscapular shield covered with transversal striations and small scales ordered into numerous transversal rows along these striations. Small median area situated at the level of seta *l4* bases free from scales. *Venter*. All opisthosoma covered with numerous triangular scales, larger than these on dorsal surface.



Figs 5-6. *Asiochirus nepalensis*, n. sp. Female in dorsal view (5) and ventral view (6). Scale line 100  $\mu$ m.

*Differential diagnosis:* This new species is closely related to *A. suncus*. In both species, the ventral surface of female opisthosoma is covered with numerous scales. It differs from the *A. suncus* by the following characters. In the male *A. soriculus* sp.n., the setae *l5* are relatively short, 20-25; in the female, almost all the surface of opisthonotum is covered with scales. In male of *A. suncus*, the setae *l5* are relatively long, 80-90; in

the female, the opisthonotum is almost free from scales, a few scales only are present in lateral parts of the opisthonotum.

4. *Asiochirus nepalensis* n. sp.

*Type material:* Holotype female, 4 male and 7 female paratypes from *Soriculus caudatus*, Nepal, Balutar, 26.II.1973 (Coll. STREET). Host in MNH. Holotype, 2 male and 3 female

paratypes are deposited in MNH, 1 male and 3 female paratypes in IRSNB, one female and one male paratypes in ZISP.

**Female** (holotype) (Figs 5-6). Body length, including gnathosoma 400 (400-450 in 10 paratypes), width 105 (105-115). *Dorsum*. Propodosomal shield 90 (90-105) long in midline. Postscapular shield 65 (65-80) long, covered with 11-15 transversal interrupted lines. The cuticle behind the postscapular shield covered with transversal striations only. Small scales ordered into transversal rows covered the median third of opisthonotum between the levels of seta *d2* and *l3* bases. *Venter*. Median part of opisthosoma covered with numerous scales, larger than those on dorsal surface.

**Male**. Body length, including gnathosoma, 320-335 (in 8 paratypes), width 105-110. *Dorsum*. Propodosomal shield 95-100 long in midline. Postscapular shield 50-65, covered with 5-7 transversal interrupted lines. Hysteronotal shield 95-105 long, entire, weakly sclerotized and without ornamentation. *Venter*. Penis about 35-40 long. Setae *l5* 35 (35-40) long. Transversal sclerites behind the coxae III (projections of the coxae III fields) well developed, but not fused to each other. Adanal suckers well developed. *Legs*. Solenidion of tibia I 30 (28-30), solenidion omega 1 of tarsi I 8-10 long, omega 3 24-26 long.

**Differential diagnosis:** This species is closely related to the previous species and it differs only by the pattern of scale distribution on the opisthonotum in the female and the slightly longer setae *l5* in the male.

#### Key to *Asiochirus* s.str. species

##### Females

1. Opisthosoma ventrally covered with large and numerous scales ..... 2
- Opisthosoma ventrally with a few poorly developed scales situated in its postero-median part only ..... *A. chimarrogale*
2. Opisthonotum covered with numerous scales in its median and lateral parts ..... 3
- Opisthonotum covered with a few scales in its lateral parts only or without scales ..... *A. suncus*
3. Opisthonotum almost completely covered with scales ..... *A. soriculus* n. sp.
- Opisthonotum bears small scales confined to the median third between the levels of seta *d2* and *l3* bases ..... *A. nepalensis* n.sp.

##### Males

1. Hysteronotal shield reaching forward the level of

- seta *d2* bases ..... 2
- Hysteronotal shield reaching forward only the level of seta *l3* bases ..... *A. chimarrogale*
2. Setae *l5* 20-40 long. Protrusions of epimeres III developed ..... 3
- Setae *l5* 80-90 long. Protrusions of epimeres III not developed ..... *A. suncus*
3. Setae *l5* 35-40 long ..... *A. nepalensis* n. sp.
- Setae *l5* 20-25 long ..... *A. soriculus* n.sp.

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