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NEW SPECIES OF *GYMNODAMPIA* (ACARI: ORIBATIDA: AMEROIDEA) FROM CHINA.

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MITES, ORIBATIDA, GYMNODAMPIA, NEW SPECIES, CHINA

SUMMARY: Five new species of *Gymnodampia* Jacot from China are proposed and described on the basis of adults: *Gymnodampia acuta* n. sp., *G. qinlingensis* n. sp., *G. sichuanensis* n. sp., *G. tegularum* n. sp. and *G. yaoi* n. sp. A key to the 16 species and subspecies of *Gymnodampia* known worldwide is presented, and their distribution is discussed.

The oribatid mite genus *Gymnodampia* Jacot, 1937 is Holarctic in distribution, with species found in East Asia and eastern North America, and is among the more species-rich genera in deciduous forest litter in Eastern Asia. Recently (Chen et al., 2004), we revised this genus, described new species from eastern North America, placed the genera *Cristamerus* Hammer, 1977 and *Defectamerus* Aoki, 1984 in junior synonymy with *Gymnodampia*, and discussed its placement in the Brachypylina. Although immatures of *Gymnodampia* are apheredermous, whereas known ameroid immatures are eupheredermous, we cannot find convincing apomorphic traits linking this genus to any known family of apheredermous Brachypylina. Thus, we retain *Gymnodampia* in the Ameroidea, and place it in Ameridae based on adult similarities. The purpose of this paper is to describe five new species of *Gymnodampia* from China, to provide a key to all known *Gymnodampia* species, and to briefly analyse their distribution.

MATERIAL & METHODS

Measurements and descriptions are based on specimens mounted in temporary cavity slides and on permanent slides, as well as published descriptions. Terminology used in this paper follows Grandjean (see Travé & Vachon, 1975 for references) and Chen et al. (2004). All examined specimens were adults; details of their number and provenance are given below. The following conventions of measurement

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and description are used: total length: measured from
tip of rostrum to posterior edge of notogaster; length
of notogaster: measured from anterior margin to pos-
terior edge of notogaster; width of notogaster: refers
to maximum notogastral width; distance between setae of prodorsum and notogaster: measured as
mutual distance between central point of insertion of setal pairs, or (for different setae) as mutual distance
between central point of insertion of setae on same
setal pairs, or (for different setae) as mutual distance
between central point of insertion of setae on same
side; abbreviations for setae of prodorsum: ro: rostral
seta; le: lamellar seta; in: interlamellar seta; ss: sensi-
lus; ex: exobothridial seta; leg and palp setal formulae:
famulus is included in tarsal setal count on leg I and
solenidial counts are in parentheses. The unidenti-
certainty nomenclature for notogastral setae is used
herein as outlined by Norton in Balogh & Balogh
(1988).

Abbreviations for Collections: CNC: Canadian
National Collection of Insects and Arachnids, Agri-
culture and Agri-Food Canada, Ottawa, Canada;
IZCAS: Institute of Zoology, Chinese Academy of
Sciences, Beijing, China; RAN: personal collections
of R. A. Norton, Syracuse, New York, USA.

Measurements are given as mean, and range in
parentheses.

Specimens for scanning electron microscopy were
cleaned by soaking in Terg-A-Zyme®solution for
3-6h, followed by brief (1-2s) submersion in an ultra-
sonic bath. Specimens were then critical-point dried,
mounted on Al stubs with double-sided sticky tape,
and gold-coated in a Hummer sputter apparatus.

Gymnodampia Jacot, 1937

Gymnodampia Jacot, 1937,
Am. Midl. Nat. 18: 242; Chen et al., 2004:
Cristamerus Hammer, 1977,
Biol. Skr. 21(4): 22; Chen et al., 2004:
Defectamerus Aoki, 1984,
Zool. Sci., 1: 135; Chen et al., 2004:

Diagnosis. Rostrum with 2 incisions (Figs. 9, 21);
setae le and in setiform, arising from round tubercles
(Figs. 22, 29, 34); enantiophysis A present, small;
depth pit present lateral to enantiophysis A (Figs. 12,
29, 34); bothridium bowl like, protruding to form
bothridial enantiophysis with humeral tubercle of
notogaster (Figs. 10, 32); lateral apophysis present
(Fig. 10); dorsosejugal region extensively depressed;
(anterior margin of notogaster fused to prodorsum
without scissure or suture (Fig. 22), indicated only by
sharp change in contour; humeral region of notogas-
ter with strong crest, ending in anteromedial tubercle
(Figs. 10, 20); notogaster with 8-10 pairs of setae,
setae ln, lp, and h series conspicuously longer than
others; pedotectum I present, typical pedotectum II
absent, but with triangular tubercle S posterior to
acetabulum II (Fig. 17); tubercle S with deep, circular
pit present ventrally (Fig. 17, white arrowhead); epi-
meral setae long, setation: 3-1-3-3; setal constriction
modified; 1 pair of aggenital setae, 6 pairs of geni-
tal setae (Fig. 31), 2 pairs of anal setae and 3 pairs of
adanal setae present; setae ad1 preanal and ad1, pos-
tanal; lyrifissure iad between setae ad2 and ad3, parallel
to lateral margin of anal plate (Fig. 2); tracheal
system normal; ovipositor normally developed
without coronal setae; genital papilla Va conical, lar-
ger than Vm and Vp; subcapitulum diarthric (Figs.
17, 25, 33); rutellum pantelobasic, small axillary sac-
cule present at base of palp; chelicera chelate-dentate
with 2 setae, cha slender, with barbs, chb thick, expan-
ded distally, with dense barbs (Figs. 3, 19); palp
setation 0-2-1-3-8(1), with solenidion recumbent
(Figs. 18, 25); all legs monodactyl, setal formulae
(trochanter to tarsus): leg I 1-5-3(1)-4(2)-20(2); leg II
1-5-3(1)-4(1)-16(2); leg III 2-3-2(1)-3(1)-15; leg IV
3-1-3-3-8(1), with solenidion recumbent
distally, with dense barbs (Figs. 3, 19); palp
setation 0-2-1-3-8(1), with solenidion recumbent
(Figs. 18, 25); all legs monodactyl, setal formulae
(trochanter to tarsus): leg I 1-5-3(1)-4(2)-20(2); leg II
1-5-3(1)-4(1)-16(2); leg III 2-3-2(1)-3(1)-15; leg IV
1-2-3-3-3(1)-12; proral setae of tarsi II to IV small,
spine-like (Fig. 14); femora I and II with proximal
retrorecta (Figs. 10, 12, 32, 34), III and IV with
proximal spur; femora I to IV and trochanters III and
IV with porose areas; solenidion ω3 separated from
ω1 on tarsus I, positioned distally, famulus e spine like
(Fig. 4).

Gymnodampia acuta n. sp.
(Figs. 1-12)

Material examined: Holotype: adult female (in
alcohol, Wu-43), CHINA: Fujian Province: Wuyi
Mt. (26. 4° N, 116. 4° N), Guadun, 3 Aug., 1983,
Hui-Fu Wang and Xiao-Mei Zhang, litter
(IZCAS); Paratypes: 3 adults (in alcohol), with same
data as holotype; 7 adults (6 in alcohol, 1 mounted on
**Figs. 1-3: Gymnodampia acuta n. sp., adult ♀, 1, dorsal aspect; 2, ventral aspect (gnathosoma removed); 3, chelicera, abaxial view. Scale bars: 1-2 = 200 µm, 3 = 50 µm.**
Figs. 4-8: Gymnodamnia acuta n. sp., adult ♀ legs I to IV, abaxial aspect, 4, leg I; 5, leg II; 6, leg III; 7, leg IV (femur and genu); 8, leg IV (tibia and tarsus). Scale bar = 100 µm.

Etymology. This specific epithet “acuta” is from the Latin for “pointed” and refers to the acute, triangular rostrum of this species.

Diagnosis. Adult. Total length 632-778 \( \mu \)m; rostrum acute, triangular between incisions; apophysis Aa rounded; bothridium with angular tubercle, with marginal incisions posteriorly; pedotectum I weakly developed, rounded distally and on outside margin; notogastral setae 9 pairs, setae \( h_1 \) and \( h_2 \) series longer than other notogastral setae, \( h_1 \) and \( h_2 \) inserted almost at same level, distance between \( h_2 \) longer than that between \( h_3 \).

Adult Measurements. Female (n=3): total length 734 \( \mu \)m (688-778 \( \mu \)m), notogastral width 432 \( \mu \)m (421-446 \( \mu \)m), notogastral incisions 497 \( \mu \)m (478-518 \( \mu \)m). Male (n=3): total length 670 \( \mu \)m (632-729 \( \mu \)m), notogastral width 400 \( \mu \)m (365-446 \( \mu \)m), notogastral incisions 440 \( \mu \)m (397-470 \( \mu \)m).

Integument. Integument smooth, except granular on projecting tubercles and crests. Cerotegument reticulate.

Prodorsum. Rostrum between incisions acute, triangular, depth of rostral incisions only evident in ventral aspect, as part of rostrum dorsally overlying base of incisions (Figs. 1, 2, 9). Seta ro long, tapered, ro, le and in barbed, ro length 92 \( \mu \)m (88-96 \( \mu \)m), distance between ro 94 \( \mu \)m (84-104 \( \mu \)m), le length 111 \( \mu \)m (104-120 \( \mu \)m), distance between le 103 \( \mu \)m (92-112 \( \mu \)m), in length 132 \( \mu \)m (128-136 \( \mu \)m), distance between in 91 \( \mu \)m (84-104 \( \mu \)m). Apophysis Aa rounded. Bothridium with angular tubercle posteriorly; with marginal incisions posteriorly (Figs. 1, 11). Sensillus attenuate, basal half slightly barbed, almost smooth distally, ss length 346 \( \mu \)m (320-388 \( \mu \)m), ex length 45 \( \mu \)m (40-48 \( \mu \)m).

Notogaster. Nine pairs of notogastral setae, seta \( h_p \) absent (Fig. 1). Setae \( c_1 \) and \( la \) short (ca. 60 \( \mu \)m), \( h_m \) and \( h_j \), \( h_2 \) and \( h_3 \) flagellate and slightly barbed, \( h_m \) length 504 \( \mu \)m (446-543 \( \mu \)m), \( h_j \) length 348 \( \mu \)m (324-365 \( \mu \)m), \( h_2 \) length 227 \( \mu \)m (194-243 \( \mu \)m), \( h_3 \) length 192 \( \mu \)m (170-211 \( \mu \)m), distance between \( h_2 \) and \( h_3 \) (144-172 \( \mu \)m), distance between \( h_3 \) (124-148 \( \mu \)m); \( h_1 \) and \( h_2 \) inserted almost at same level (Fig. 1); setae of \( p \)-series short (ca. 40 \( \mu \)m).

Venter. Pedotectum I weakly developed, outside margin and anterior edge rounded (Fig. 2). Tubercle \( S \) large, rounded distally. Adanal setae barbed, short (ca. 40 \( \mu \)m).

Gnathosoma. Normal for genus.

Legs. Setae \( v' \) of femora I-II, \( v' \) of femora III-IV, \( l' \) and \( v' \) of tibiae I-II, \( l' \) and \( v' \) of tibia III strong, almost straight and smooth (Figs. 4-8). Setae \( d \) and \( l' \) of genu I about 0. 9 times length of segment, \( (l) \) of genu I about 3 times length of segment, \( (tc) \) longest setae on tarsus I, nearly 0.6 times length of segment; \( d \) of femur IV about 1. 5 times length of segment, \( d \) and \( l' \) of genu IV about 4 and 3 times of length of segment, respectively. Genual solenidia \( s_1 \) curved, about 1.3 times length of segment, \( s_2 \) III almost equal to length of segment, \( s_2 \) III shorter than segment; tibial solenidia \( q_2 \) I almost equal to length of segment and \( q_2 \) I about 0.5 times length of segment, respectively, \( q_2 \) II about 0.5 times length of segment, \( q_3 \) and \( q_4 \) IV about 0.3 and 0.2 times length of segment, respectively; tarsal solenidia \( o_2 \) I, \( o_2 \) II, \( o_2 \) II and \( o_2 \) II clearly shorter than respective segment.

Immatures. Unknown.

Distribution. Known only from Wuyi Mountain, Fujian Province, China.

Remarks. This species is similar to G. soonkii (Choi et Aoki, 1985), G. jacoti Chen et al., 2004, G. regulorum n.sp., and G. fusco (Fujikawa, 2002) in having 9 pairs of notogastral setae. It differs from them by: the acute triangular rostrum between the incisions and pedotectum I more weakly developed, distal margin rounded and not projecting when viewed dorsally. There are clear differences in notogastral setation between this species and G. soonkii and
Figs. 9-12: *Gymnodamnia acuta* n. sp., scanning electron micrographs of adult, 9, dorsal aspect of rostrum, base of rostral incisions overlaid by rostrum indicated by dashed white lines; 10, dorsolateral aspect of podosoma, proximal retrorectum of femur II indicated by black arrowhead; 11, anterodorsal aspect of bothridium; 12, dorsal aspect of enantiophysis *A* and femur I, pit lateral to enantiophysis *A* indicated by white arrowhead, proximal retrorectum of femur I indicated by black arrowhead.

Figs. 13-14: *Gymnodamnia qinlingensis* n. sp., scanning electron micrographs of adult, 13, dorsal aspect of bothridium; 14, lateral aspect of tarsus IV, with spiniform setae (*p*) indicated.
**Gymnodampia qinlingensis** n. sp.  
(Figs. 13-19)

**Material examined:** Holotype: adult female (in alcohol, To-155), CHINA: Shaanxi Province: Qinling Mt., Foping County (33.5°N, 107.9°E), Loubangou, 1605M, 16 Nov., 1995 (IZCAS); Paratypes: 4 adults (in alcohol), with same data as holotype; 13 adults (10 in alcohol, 3 mounted on slide, To-164), Foping County, Huodiba, 1675M, 18 Nov., 1995; 2 adults (in alcohol, To-160), Foping County, Daoliushui, 1605M, 17 Nov., 1995; 3 adults (mounted on slides, To-161), Foping County, Sanguanmiao, 1600M, 17 Nov., 1995. All collected by ZHI-GAO ZENG. Paratypes deposited in CNC, IZCAS and RAN.

**Etymology.** This new species is named for its type locality, Qinling Mt., China.

**Diagnosis.** Total length 689-802µm; rostrum tongue-shaped between incisions; apophysis Aa large, rounded; bothridium with angular tubercle posteriorly; with marginal incisions posteriorly (Fig. 13). Sensillus attenuate, slightly barred in basal half, ss length 243µm (212-264µm), ex length 48µm (40-56µm).

**Notogaster.** 10 pairs of notogastral setae (Fig. 15). Setae c2 and la relatively short (ca. 86µm); setae lm, lp, h1, h2 and h3 long, barbed, lm length 212µm (204-224µm), lp length 170µm (152-184µm), h1 length 185µm (168-200µm), h2 length 118µm (104-128µm), h3 length 150µm (132-160µm), distance between lm and lp 113µm (108-116µm), distance between lp and h3 115µm (104-132µm). lm inserted posterior to la; lp inserted posterior to opening of opisthosomal gland (Fig. 15); setae of p-series short (ca. 40µm).

**Venter.** Pedotectum I well developed, triangular. Tubercle S large, distally rounded. Adanal setae barred, short (ca. 35µm).

**Gnathosoma.** Normal for genus.

**Legs.** Dorsal and lateral setae of femora, genua and tibiae of all legs thick, except v′ of genua I and II relatively slender. Setae d and l′ of femur I about 0.6 times length of segment, (l) of genu I about 1.3 times length of segment; d and l′ of femur IV about 0.6 times length of segment, d and l′ of genu IV about 1.6 times length of segment. Genual solenidion sII 0.8 times length of segment; tibial solenidia q1,q same length, and q2,l about 0.6 times length of segment, respectively.

**Immatures.** Unknown.

**Distribution.** Known only from the type locality (Qinling Mountains), Shaanxi Province, China.

**Remarks.** Gymnodampia species having 10 pairs of notogastral setae include this new species, and five known species: Gymnodampia lindquisti Chen et al., 2004, Gymnodampia setata Jacot 1937, Gymnodampia spinosa (Hammer, 1977), Gymnodampia sungohi (Choi, 1994) and Gymnodampia suananensis (Aoki & Yamamoto, 2000). These species are similar, but they can be distinguished using the key to species (see below).

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**Gymnodampia sichuanensis** n. sp.  
(Figs. 20-25, 29-31)

**Material examined:** Holotype: adult female (in alcohol, W-90-25), CHINA: Sichuan Province:
Figs. 15-16: *Gymnodampia qinlingensis* n. sp., adult ♂, 15, dorsal aspect; 16, ventral aspect (gnathosoma removed). Scale bars = 200 µm
Figs. 17-19. *Gymnodampia qinlingensis* n. sp., scanning electron micrographs of adult, 17, ventral aspect of gnathosoma and epimeral region, pit of tubercle S indicated by white arrowhead; 18, lateral aspect of palptarsus, solenidion indicated by black arrowhead; 19, lateral aspect of chelicera and distal part of rutellum.

Figs. 20-22. *Gymnodampia sichuanensis* n. sp., scanning electron micrographs of adult, 20, lateral aspect; 21, dorsal aspect of rostral region; 22, dorsal aspect.
Figs. 23-25: *Gymnodampia sichuanensis* n. sp., adult ♀, 23, dorsal aspect; 24, ventral aspect; 25, ventral aspect of subcapitulum. Scale bars: 23-24=200 µm, 25=100 µm.
Songpan County (32. 6° N, 103. 6° E), Zhalitai, 3000M, 2 July, 1990 (IZCAS). Paratypes: 13 adults (10 in alcohol, 3 mounted on slides), with same data as holotype; 8 adults (6 in alcohol, 2 mounted on slides, W-90-28), Songpan County, Huwangonsgi, 3000M, 3 July, 1990; 1 adult (in alcohol, W-90-19), Nanping County, Jiuzhaigou (33. 2° N, 103. 9° E), 5 July, 1990. All collected by Fu-Sheng Huang. Paratypes deposited in CNC, IZCAS and RAN.

**Etymology.** This specific epithet refers to the known distribution of this species in Sichuan Province, China.

**Diagnosis.** Total length 851-907 \( \mu \)m; rostrum tongue-shaped between incisions; apophysis Aa sharply triangular; bothridium with angular tubercle on lateroposterior margin, inner margin without incisions posteriorly; 8 pairs of notogastral setae present, \( l_{m} \) positioned posterior to \( l_{a} \).

**Adult Measurements.** Female (n=4): total length 863\( \mu \)m (851-882\( \mu \)m), notogastral length 530\( \mu \)m (510-551\( \mu \)m), notogastral width 558\( \mu \)m (543-575\( \mu \)m). Male (n=2): total length 891\( \mu \)m (875-907\( \mu \)m), notogastral length 506\( \mu \)m (486-527\( \mu \)m), notogastral width 559\( \mu \)m (535-583\( \mu \)m).

**Integument.** Integument smooth, except granular on projecting tubercles and crests. Cerotegument reticulate.

**Prodorsum.** Rostrum tongue-shaped between incisions, tip blunt, with distinct depression (Figs. 21, 23). Setae \( r_{o} \) thin, slender, clearly barbed, length 116\( \mu \)m (108-132\( \mu \)m), distance between \( r_{o} \) 92\( \mu \)m (87-104\( \mu \)m); \( l_{e} \) slightly barbed, length 120\( \mu \)m, distance between \( l_{e} \) 99\( \mu \)m (96-104\( \mu \)m), in clearly barbed, length 148\( \mu \)m (136-160\( \mu \)m), distance between in 80\( \mu \)m (72-87\( \mu \)m). Apophysis Aa sharply triangular (Figs. 23, 29). Bothridium with angular tubercle posteriorly; without marginal incisions posteriorly (Fig. 30). Sensillus attenuate, weakly barbed, ss length 261\( \mu \)m (200-292\( \mu \)m), ex length 65\( \mu \)m (60-72\( \mu \)m).

**Notogaster.** 8 pairs of notogastral setae, setae lp and \( h_{i} \) absent (Figs. 22, 23). Setae \( c_{2} \) and \( l_{a} \) relatively short (ca. 86 and 110\( \mu \)m, respectively), setae \( l_{m} \), \( h_{j} \) and \( h_{z} \) relatively long, tapered, with few barbs, \( l_{m} \) length 189\( \mu \)m (180-200\( \mu \)m), \( h_{j} \) length 192\( \mu \)m (184-200\( \mu \)m), \( h_{z} \) length 150\( \mu \)m (144-160\( \mu \)m); \( l_{m} \) positioned posterior to \( l_{a} \); setae of \( p \)-series very short (ca. 42\( \mu \)m).

**Venter.** Pedotectum I well developed, triangular in dorsoventral aspect. Tubercle \( S \) large, rounded distally. Adanal setae barbed.

**Gnathosoma.** Normal for genus.

**Legs.** Dorsal and lateral setae of femora, genua and tibiae of all legs thick, except \( v_{o} \) of genua I and II relatively slender, proximal spur of femora III and IV small. Setae \( d \) and \( l' \) of femur I about 0.5 times length of segment, \( (t_{c}) \) nearly 0.9 times length of segment; \( d \) and \( l' \) of genu IV about 1.5 times length of segment. Genual solenidion \( a_{l} \) slightly longer than segment, tibial solenidia \( q_{II} \) about 0.4 times length of segment, \( q_{III} \) 0.5 times length of segment.

**Immatures.** Unknown.

**Distribution.** Known only from Sichuan Province, China.

**Remarks.** This species can be distinguished from others having 8 pairs of notogastral setae including G. crassisetiger (Aoki, 1984), with 3 subspecies (Aoki, 1984; Aoki, 1991; Choi & Aoki, 1985), and G. yaoi n. sp. by: larger body size; apophysis Aa shaped like a sharp triangular tubercle; and bothridium without marginal incisions posteriorly.

**Gymnodampia tegularum** n. sp.  
(Figs. 26-28)

**Material examined:** Holotype: adult male (in alcohol), CHINA: Guizhou Province: Xishui County (28. 3° N, 106. 2° E), Daleipo, 750M, 29 Sept., 2000, Yan Zhang (IZCAS). Paratypes: 2 adult males (in alcohol), with same data as holotype. Paratypes deposited in CNC and IZCAS.

**Etymology.** The specific epithet “tegularum” is from the Latin for ‘roof tiles’ and refers to the overlapping of the medial region of the rostrum by the dorsal part of the rostrum lateral to incisions.

**Diagnosis.** Total length 502-543\( \mu \)m; rostrum medially short, tongue-shaped between incisions; dorsal part of rostrum lateral to incisions extending medially over incisions and overlapping basally, so that incisions only visible in ventral aspect; apophysis Aa small, rounded; bothridium with angular tubercle on lateroposterior margin, with marginal incisions posteriorly; 9 pairs of notogastral setae, \( l_{a} \) and \( l_{m} \) inserted almost at same level, distance between \( h_{z} \) slightly longer than that between \( h_{j} \), \( h_{1} \) and \( h_{2} \) inserted almost at same level.
Figs. 26-28: Gymnodampa tegularum n. sp., adult $\delta$, 26, dorsal aspect; 27, ventral aspect; 28, chelicera, abaxial view. Scale bars: 26-27 = 100$\mu$m, 28 = 50$\mu$m.
**Adult Measurements.** Male (n=3): total length 518µm (502-543µm), notogastral length 284µm (275-292µm), notogastral width 305µm (292-324µm).

**Integument.** Integument smooth, except granular on projecting tubercles and crests. Cerotegument reticulate.

**Prodorsum.** Rostrum medially short, tongue-shaped between incisions; dorsal part of rostrum lateral to incisions extending medially over incisions and overlapping basally, so that rostral incisions only visible in ventral aspect (Fig. 26, 27). Setae ro thin, slender, slightly barbed, length 83µm (72-92µm), distance between ro 79µm (72-84µm). Setae le and in slightly barbed, le length 84µm (80-88µm), distance between le 79µm (72-88µm), in length 100µm, distance between in 65µm (64-68µm). Apophysis Aa small, rounded. Bothridium with angular tubercle on lateroposterior margin; with marginal incisions posteriorly (Fig. 26). Sensillus attenuate, barbed slightly at base, ss length 255µm (228-276µm), ex length 32µm (24-36µm).

**Notogaster.** 9 pairs of notogastral setae, setae lp absent (Fig. 26). Setae c2 and la short (ca. 34µm); setae lm, h1, h2 and h3 long, barbed, lm length 240µm, h1 length 202µm (192-212µm), h2 length 136µm, h3 length 101µm (84-120µm), distance between h1 47µm (44-48µm), distance between h2 119µm (116-120µm), distance between h3 109µm (108-112µm); la and lm inserted almost at same level, h1 and h2 almost inserted at same level (Fig. 26); setae of p-series short (ca. 40µm).

**Venter.** Pedotectum I well developed, triangular in dorsoventral aspect. Tubercle S large, distal end acute. Adanal setae slightly barbed, short (ca. 50µm).

**Gnathosoma.** Normal for genus.

**Legs.** Shapes and lengths of segments and setae of legs similar to those of *G. acuta*. Setae (l) of genu I about 3.7 times length of segment, (tc) of tarsus I nearly 0.6 times length of segment. Genual solenidia sl about 1.7 times length of segment, tibial solenidia s1,1 1.6 times and q1,1 almost equal to length of segment, respectively, qII about 0.6 times length of segment, sIII about 0.4 times length of segment.

**Immatures:** Unknown.

**Distribution.** Only known from the type locality in Xishui County, Guizhou Province, China.

**Remarks.** The unique character states of the rostrum such that the dorsal part of rostrum lateral to incisions extends medially over incisions and overlaps basally, so that incisions are only visible in ventral aspect, can easily distinguish *G. tegularum* from other Gymnodampia species having nine pairs of notogastral setae.

**Gymnodampia yaoi** n. sp.

(Figs. 32-37)

**Material examined:** Holotype: adult female (in alcohol, Yao-3), CHINA: Sichuan Province: Qingcheng Mt. (30.9° N, 103.5° E), 28 Mar., 1986, WEN-BING YAO (IZCAS). Paratypes: 13 adults (12 in alcohol, 1 mounted on slide), with same data as holotype; Paratypes deposited in IZCAS, CNC and RAN.

**Etymology.** This new species is named in honor of Prof. WEN-BING YAO, who donated his collection of oribatid mites to IZCAS.

**Diagnosis.** Total length 512-608µm; rostrum somewhat triangular between incisions, tip slightly truncate; apophysis Aa small, rounded; bothridium with angular tubercle, with marginal incisions posteriorly; 8 pairs of notogastral setae, lm very long, subequal to length of notogaster, h1 clearly longer than h2; lm inserted anterior to la.

**Adult Measurements.** Female (n=4): total length 526µm (512-543µm), notogastral length 311µm (292-324µm), notogastral width 338µm (324-350µm). Male (n=2): total length 567µm (527-608µm), notogastral length 344µm (324-365µm), notogastral width 373µm (340-405µm).

**Integument.** Integument smooth, except granular on projecting tubercles and crests. Cerotegument reticulate.

**Prodorsum.** Rostrum between rostral incisions somewhat triangular, tip slightly truncated (Fig. 35). Setae ro, le and in clearly barbed, ro length 80µm (52-92µm), distance between ro 79µm (64-88µm), le length 85µm (80-96µm), distance between le 75µm (72-80µm), in length 96µm (92-100µm), distance between in 66µm (60-72µm). Apophysis Aa small, rounded. Bothridium with angular tubercle posteriorly, with marginal incisions posteriorly (Fig. 32). Sensillus attenuate, slightly barbed at base, ss length 214µm (164-252µm), ex length 29µm (24-32µm).

**Notogaster.** 8 pairs of notogastral setae, setae lp and h3 absent (Fig. 35). Setae c2 and la short.
Figs. 29-31. *Gymnodampia sichuanensis* n. sp., scanning electron micrographs of adult, 29, dorsal aspect of enantiophysis \( A \), pit lateral to enantiophysis indicated by white arrowhead; 30, anterodorsal aspect of bothridium; 31, ventral aspect of genital region.

Figs. 32-34. *Gymnodampia yaoi* n. sp., Scanning electron micrographs of adult, 32, dorsal aspect of bothridium; 33, ventral aspect of subcapitulum; 34, dorsal aspect of enantiophysis \( A \) and femur I, pit lateral to enantiophysis \( A \) indicated by white arrowhead, proximal retrotectum of femur I indicated by black arrowhead.
Figs. 35-37: Gymnodampia yaoi n. sp., adult ♂. 35, dorsal aspect; 36, ventral aspect; 37 chelicera, abaxial view. Scale bars: 35-36 = 100 µm, 37 = 50 µm.
Gnathosoma. Normal for genus.

Legs. Shapes and lengths of segments and setae of legs similar to those of G. acuta. Setae of femur I about 0.6 times length of segment, d of femur IV nearly same length as segment. Genual solenidion of straight, about same length as segment; tibial solenidion about 0.6 times length of segment.

Immatures. Unknown.

Distribution. Known only from the type locality in Sichuan Province, China.

Remarks. As seta lm is subequal to the length of the notogaster, G. yaoi is very similar to G. crassisetiger australis (Aoki, 1991) and G. crassisetiger coreana (Choi & Aoki, 1985), but can be distinguished as follows: in G. yaoi, notogastral seta lm is inserted anterior to la, and the distance between lm and h2 is almost 3.0-3.5 times that between h2 and h1; whereas in the latter two taxa, notogastral seta lm is inserted posterior to or at same level as seta la, and the distance between lm and h2 is almost 4.5-7.5 times that between h2 and h1.

KEY TO ADULTS OF WORLD SPECIES AND SUBSPECIES
OF THE GENUS Gymnodampia

1. 10 pairs of notogastral setae (both lp and h3 present). 2 — 9 or 8 pairs of notogastral setae (lp absent, h3 present or absent) 7
2. Rostrum without incision; seta la inserted on or just adjacent to humeral crest and positioned closer to seta c2 than to seta lm, distance between lm and la about 1.5 times that between c2 and la (Pakistan).  — Rostrum with pair of incisions; seta la inserted posterior to humeral crest and positioned closer to seta lm than to seta c2, distance between lm and la shorter than that between c2 and la. 3
3 Femur IV with 3 setae; notogastral setae h1 and h3 almost at same level, h3 positioned posterior to this level.  — Femur IV with 2 setae; notogastral setae h1, most posterior seta, most anterior seta of h-series 4
4. Lateroposterior margin of bothridium slightly protruding, not forming angular tubercle 5 — Lateroposterior margin of bothridium clearly protruding, forming angular tubercle 6
5. Bothridium without marginal incisions posteriorly; seta lp inserted near opening of opisthosomal gland (N. America) G. tegularum (Berlese, 1916) — Bothridium with marginal incisions posteriorly; seta lp inserted well posterior to opening of opisthosomal gland.  — G. yunnanensis n. sp. (China) 7
6. Incisions of rostrum shallow; bothridium without marginal incisions posteriorly; seta lp inserted near opening of opisthosomal gland.  — Incision of rostrum deep; bothridium with marginal incisions posteriorly; seta lp inserted well posterior to opening of opisthosomal gland.  — G. qinlingensis n. sp. (China) 8
7. 9 pairs of notogastral setae (lp absent) 8 — 8 pairs of notogastral setae (lp and h3 absent) 12
8. Rostrum short, tongue-shaped between incisions, dorsal part of rostrum lateral to incisions extending medially over incisions and overlapping basally, so that incisions only visible in ventral aspect  — Rostrum wide, tongue like or trapezoid-shaped between incisions, dorsal part of rostrum lateral to incisions not extending medially; distance between h2 clearly shorter than that between h3; pedotectum I weakly developed, distally rounded in dorsoventral view.  — G. acuta n. sp. 9
9. Rostrum acute triangular between incisions, dorsal part of rostrum lateral to incisions extending medially; h2 and h3 inserted almost at same level, distance between h3 longer than that between h1; pedotectum I weakly developed, distally rounded in dorsoventral view.  — G. acuta n. sp. 10
10. Bothridium without marginal incisions posteriorly; h3 inserted well posterior of opisthosomal gland opening, distance between h3 and h2 0.5-0.9 times that between h4 and h1.  — Bothridium with marginal incisions posteriorly; h3 inserted just posterior to opisthosomal gland opening, distance between h3 and h2 1.6-2.1 times that between h2 and h3.  — G. acuta n. sp. 11
11. Notogastral seta h2 attenuate, almost same length as h3, 0.65-0.8 times length of h3; setae d and t of genu IV very long, d 2. 1-2.5 times length of segment, l' 3. 1-4. 0 times length of segment.  — G. soonkii (Choi et Aoki, 1985)
Notogastral seta \(h_2\), isodiametric along most of length, tapered distally, 0. 4-0. 6 times length of \(h_3\), 0. 3-0. 4 times length of \(h_4\); setae \(d\) and \(l\) of genu IV long, \(d\) nearly 2. 5-2. 8 times length of segment, \(l\) nearly 3. 1-3. 8 times length of segment. 

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