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CHARLETONIA TALEBII N. SP. FROM IRAN (ACARI, PROSTIGMATA, ERYTHRAEIDAE)

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ABSTRACT — *Charletonia talebii* **n. sp.** (Acari, Erythraeidae) is described and illustrated from ectoparasitic larvae on nymphs and adults of undetermined Cicadellidae (Heteroptera) from Jahrom, Iran. We present a key to larval species of *Charletonia* that have two setae between coxae II and III.

KEYWORDS — Acari; Prostigmata; *Charletonia*; new species; Iran

INTRODUCTION

The genus *Charletonia* Oudemans, 1910 is known only from larvae and distributed worldwide.

Mites of the genus *Charletonia* are poorly studied in Iran. Only eight species of larval *Charletonia* have been reported from Iran hitherto: *C. krendowskyi* (Feider, 1954); *C. saboorii* Karimi Iravanlou, Kamali and Talebi, 2002; *C. nazaleae* Karimi Iravanlou, Kamali and Talebi, 2002; *C. damavandica* Karimi Iravanlou, Kamali and Talebi, 2002; *Charletonia ahwazensis* Haitlinger and Saboori, 2007; *C. mehranensis* Haitlinger and Saboori, 2007; *C. behbahanensis* Haitlinger and Saboori, 2008 and *C. bojnordensis* Haitlinger and Saboori, 2008. (Karimi Iravanlou *et al.*, 2002; Haitlinger and Saboori 2007, 2008).

In this paper, we describe the larva of *Charletonia talebii* **n. sp.** ectoparasitic on nymphs and adults of undetermined Cicadellidae (Heteroptera) from Jahrom city, Fars province, Iran.

MATERIALS AND METHODS

Larvae were attached to the pronotum and abdomen of adults and nymphs (Cicadellidae). They were detached and preserved in 75% ethanol, cleared in lactophenol solution, and mounted on microscopic slides using Faure medium on a glass slide. Measurements (given in micrometers) made using BX51 phase contrast Olympus microscope. Figures were drawn using the same microscope equipped with drawing tube and magnification changer. The terminology and abbreviations follow Robaux (1974) and Saboori *et al*. (2009).

Charletonia talebii Sedghi, Saboori and Hakimitabar n. sp.

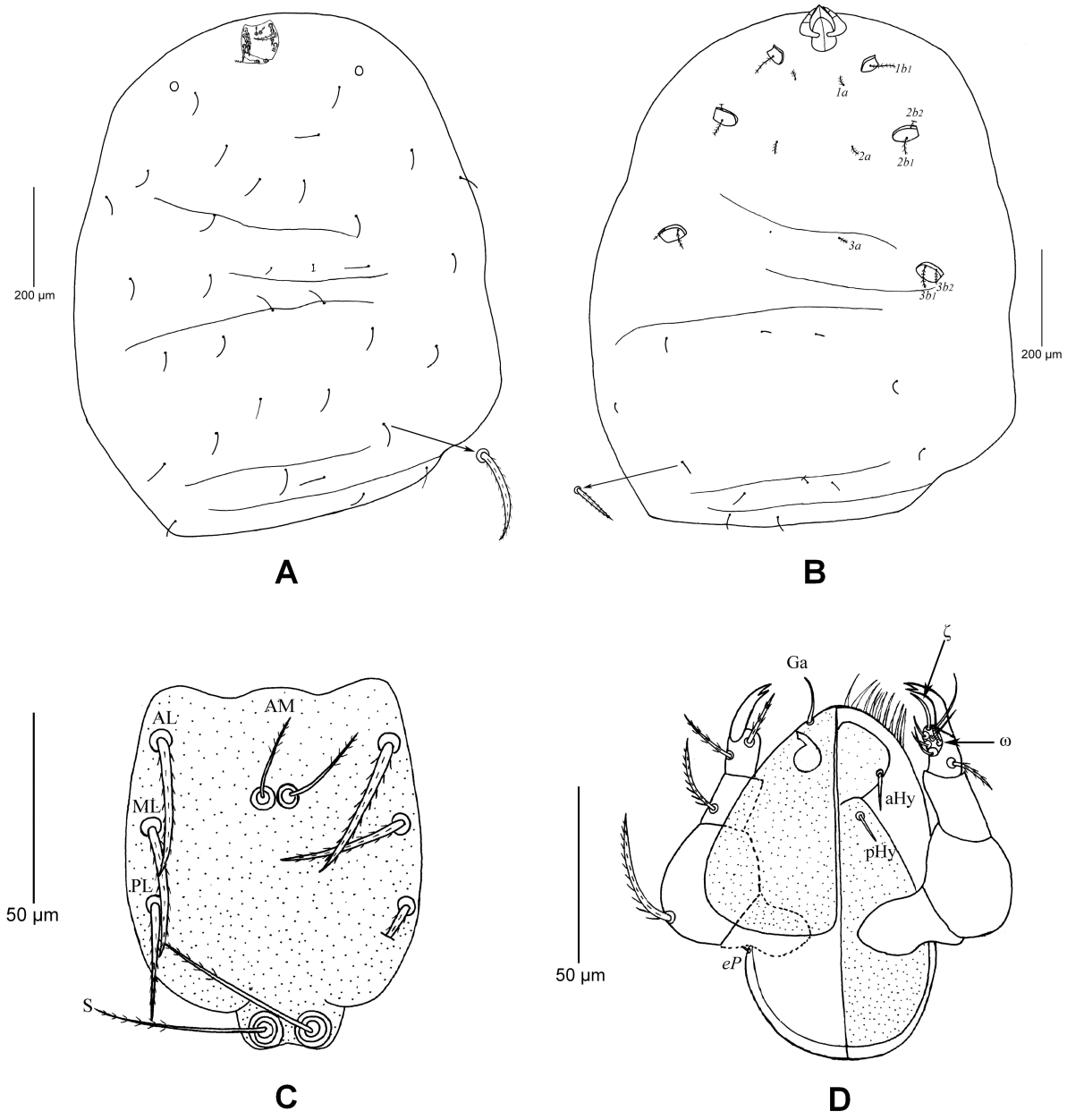

FIGURE 1: *Charletonia talebii* **n. sp.** (larva). A – Dorsal view of idiosoma and setal details; B – Ventral view of idiosoma and setal details; C – Scutum; D – Ventral view (right) and dorsal view of gnathosoma (left).

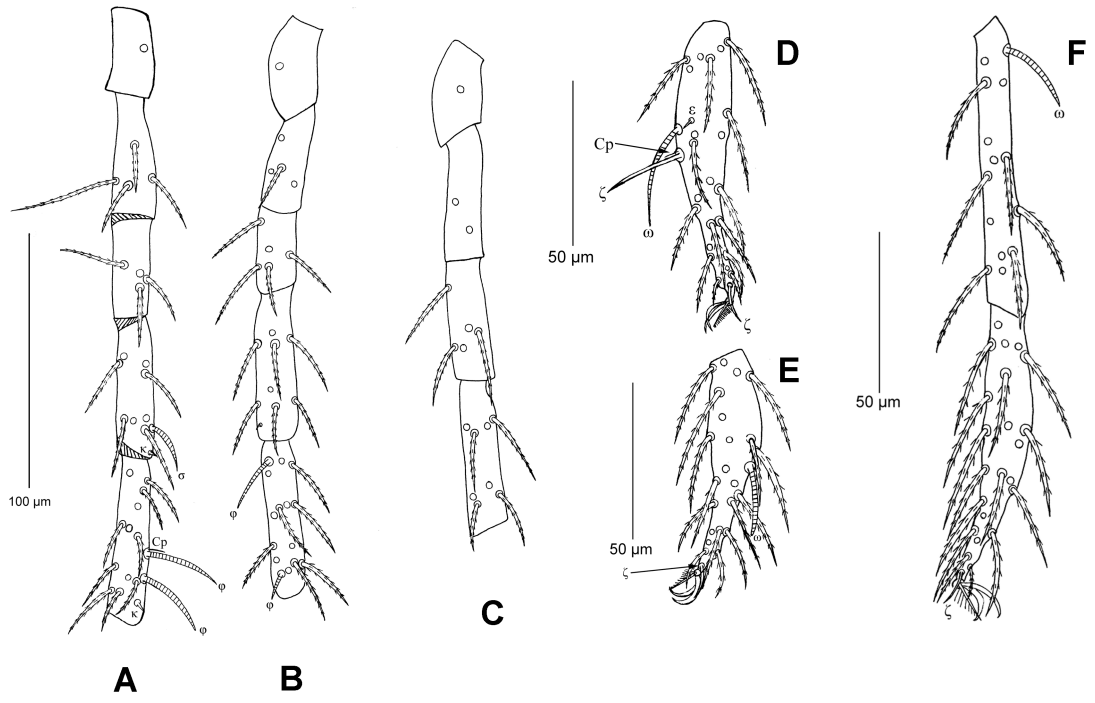

FIGURE 2: *Charletonia talebii* **n. sp.** (larva). A – Leg I, Tr-Ti; B – Leg II, Tr-Ti; C – Leg III, Tr-Ge; D – Ta I; E – Ta II; F – Ti-Ta III.

(Figures 1-2)

Diagnosis — Callidosomatine larva with the following features: Gnathosoma with 2 smooth hypostomalae (aHy, pHy), anterior pair of sensilla (AM) shorter than all setae on scutum. Fn Ge = 8-8-8; fnTi = 12-13-13; legs short (IP < 1200),Ti I 45-60; Ti III 72-96, two setae between coxae II and III, two solenidia on Ti II, Cp present on Ti I and Ta I.

Description — **Holotype larva** Dorsal surface with 34 (fD) barbed and pointed setae (Figure 1A); One eye on each side of idiosoma and 50 µm in diameter; scutum pentagonal, punctate and longer than wide; lateral parts of anterior border slightly concave whereas median part slightly convex, lateral borders slightly convex; posterior border convex except near S bases which is slightly concave; scutum with two pairs of sensilla and three pairs of normal setae. AL, ML and PL barbed and pointed, PL slightly shorter than ML and AL. Anterior sensilla (AM) shorter than posterior sensilla (S), both pointed; AM with short barbs in distal half and S barbed in distal 1/3 (Figure 1C).

Ventral surface of idiosoma with 12 (fV) pointed setae with fine barbs. Sternalae *1a* (between coxae I), *2a* (between coxae II) and *3a* (between coxae II and III) barbed. NDV = 34 + 12 = 46. Coxa I with one barbed seta (*1b*); coxae II and III with two barbed setae. All coxalae pointed (Figure 1B). Supracoxal seta of leg I peg like, 3 long.

Leg segmentation formula: 7-7-7. Leg setal formula: Leg I: Ta- 1ω, 1ε, 2ζ, 1Cp, 22n; Ti- 2φ, 1Cp, 1κ, 12n; Ge- 1 , 1κ, 8n; TFe- 5n; BFe- 4n; Tr- 1n (Figures 2A and 2D). Leg II: Ta- 1ω, 1ζ, 22n; Ti- 2φ, 13n; Ge- 1κ, 8n; TFe- 5n; BFe- 4n; Tr- 1n (Figures 2B and 2E). Leg III: Ta- 1ζ, 22n; Ti- 1φ, 13n; Ge- 8n; TFe- 5n; BFe- 2n; Tr- 1n (Figures 2C and 2F). Dorsal and ventral surface of legs punctate.

IP = 347 + 357 + 416 = 1120 holotype

Subcapitulum with a nude galeala and two nude hypostomala (Figure 1D). Galeala longer than hypostomalae. Palpal femur and genu each with one barbed and pointed seta (Figure 1D); palpal tibia

TABLE 1: Metric data of *Charletonia talebii* n. sp. Larvae (1a, holotype; 1b-1d, paratypes). All measurements are given in μm.

Character	1a	1b	1c	1d
IL	1060	545	842	753
IW	842	411	139	525
AW	61	61	59	56
MW	66	69	61	62
PW	66	67	63	62
AA	8	7	7	7
SB	12	13	12	12
AP	44	25	29	26
AL	35	22	–	24
ML	33	–	–	13
PL	29	22	24	28
AAS	31	28	26	25
AM	20	19	19	25
S	52	48	50	44
L	99	85	87	92
W	80	76	75	79
ISD	61	41	44	41
GL	99	108	111	103
DS	26–46	30–41	31–41	28–44
1a	25	18	12	23
2a	20	23	–	29
3a	13	18	17	20
1b	49	38	43	41
$2b_1$	33	40	34	28
$2b_2$	–	19	23	25
$3b_1$	29	25	25	31
$3b_2$	24	22	28	28
PaScFed	39	30	31	28
PaScGed	22	13	18	20
aHy	7	7	8	6

Character	1a	1b	1c	1d
pHy	8	9	9	8
Ta I (L)	84	82	77	75
Ta I (H)	16	15	17	17
Ti I	60	59	45	48
Ge I	56	44	50	51
TFe I	36	31	25	28
BFe I	38	40	30	38
Tr I	34	29	28	30
Cx I	39	35	34	40
Leg I	347	320	289	310
Ta II (L)	76	75	71	72
Ta II (H)	17	17	17	17
Ti II	65	56	60	62
Ge II	56	55	52	50
TFe II	35	31	29	35
BFe II	40	38	39	45
Tr II	36	29	30	33
Cx II	49	50	46	38
Leg II	357	334	327	335
Ta III (L)	87	78	76	77
Ta III (H)	14	15	15	16
Ti III	96	82	81	72
Ge III	61	62	60	70
TFe III	44	39	41	33
BFe III	40	43	44	43
Tr III	38	39	38	38
Cx III	50	45	46	48
Leg III	416	388	386	381
IP	1120	1042	1002	1026

with three barbed and pointed setae (Figure 1D); palpal tibial claw bifurcate. Palp tarsus with 5 nude setae, a solenidion and an eupathidium (Figure 1D). fPp = 0-B-B-BBB2-5N$\omega\zeta$. Cheliceral basis and subcapitulum punctate. Supracoxal seta peg like, 5 long.

Measurements are given in Table 1.

Types The holotype (ARS-20090830-1a) larva were collected on 25 March 2008 and 3 paratype larvae (ARS-20090830-1b, c, d) were collected on 30 March 2008, by A. Sedghi ectoparasitic on undetermined nymphs and adults of Cicadellidae (Heteroptera), in Jahrom city (28°30′ N, 53°33′ E, 1050 m a.s.l.), Fars Province, Iran. The holotype and paratypes are deposited in the Acarological Collection, Jalal Afshar Zoological Museum, College of Agriculture, University of Tehran, Karaj, Iran.

Etymology — The species is named in honour of Dr. Khalil Talebi Jahromi (University of Tehran, Iran) for his great contribution to develop toxicology in Iran.

Remarks — This species belongs to the species group of *Charletonia* with two setae between coxae II-III. This group includes 15 species: *C. berlesiana* Paoli, 1937 from Italy; *C. bucephalia* Beron, 1975 from Bulgaria, Greece and Croatia; *C. edytae* Haitlinger,

1987 from Madagascar; *C. blascoi* Southcott, 1993 from Spain; *C. saboori* Iravanlou, Kamali and Talebi, 2002, *C. nazaleae* Iravanlou, Kamali and Talebi, 2002; *C. damavandica* Iravanlou, Kamali and Talebi, 2002 and *C. behbahanensis* Haitlinger and Saboori, 2008, all from Iran; *C. dalegori* Haitlinger, 2003 from Greece (Rhodes) and Croatia; *C. glifadaensis* Haitlinger, 2003; *C. kaliksti* Haitlinger, 2003; *C. kalithensis* Haitlinger, 2006; *C. samosensis* Haitlinger, 2006 all from Greece (Rhodes, Samos); *C. austensis* Haitlinger, 2007 and *C. cuglierensis* Haitlinger, 2007 both from Sardinia (Paoli 1937, Beron 1975, Haitlinger 1987, 2003, 2004, 2006, 2007, Southcott 1993, Karimi Iravanlou *et al*. 2002, Haitlinger and Saboori 2008).

It differs from *C. berlesiana* by the shorter DS (26-46 vs. 61-92), S (44-52 vs. 70), AM (19-25 vs. 58), SB (12-13 vs. 18) and AA (7-8 vs. 13); from *C. blascoi* by the shorter AM (19-25 vs. 36-37), number of setae on Ti I (12 vs. 13), Ti III (13 vs. 14), absence of solenidion on Ge II (vs. present), number of solenidion on Ta I (1 vs. 2) and presence of microseta on Ge I (vs. absent); from *C. edytae* by the shorter AW (56-61 vs. 96), MW (61-69 vs. 102), PW (62-67 vs. 116), AL (22-35 vs. 72), ML (13-33 vs. 70), AM (19-25 vs. 68), S (44-52 vs. 102), W (75-81 vs. 120), PL (15-29 vs. 70), *1b* (38-49 vs. 94), Ta I (75-82 vs. 156), Ti I (45-60 vs. 194), Ge I (44-56 vs. 150), Ta II (71-76 vs. 150), Ti II (56-65 vs. 166), Ge II (50-56 vs. 124), Ta III (76-87 vs. 150), Ti III (72-96 vs. 234) and Ge III (60-70 vs. 140); from *C. bucephalia* by the shorter AM (19-25 vs. 65-77), S (44-52 vs. 70-101), SB (12-13 vs. 17-26), Ta I (75-82 vs. 147-180), Ti I (45-60 vs. 155-190), Ge I (44-56 vs. 120-137), Ta II (71-76 vs. 145-172), Ti II (56-65 vs. 135-165), Ge II (50-56 vs. 105-125), Ta III (76-87 vs. 150-192), Ti III (72-96 vs. 192-231) and Ge III (60-70 vs. 118-143); from *C. austensis* by the shorter AM (19-25 vs. 64), Ta I (75-82 vs. 130), Ti I (45-60 vs. 136), Ge I (44-56 vs. 102), Ta II (71-76 vs. 118), Ti II (56-65 vs. 120), Ta III (76-87 vs. 132), Ti III (72-96 vs. 166), number of normal setae on Ti I (12 vs. 17), Ti II (13 vs. 17), Ti III (13 vs. 17), fζ (2-1-1 vs. 1-1-0) and number of solenidion on Ti II (2 vs. 1); from *C. cuglierensis* by the shorter AM (19-25 vs. 46-50), S (44-52 vs. 74-88), Ta I (75-82 vs. 160-172), Ti I (45-60 vs. 196-206), Ge I (44-56 vs. 154-166), Ta II (71-76 vs. 154-166), Ti II (56-65 vs. 180-190), Ge II (50-56 vs. 130-150), Ta III (76-87 vs. 164-178), Ti III (72-96 vs. 240-248), Ge III (60-70 vs. 150-160), presence of Cp on Ti I and Ta I (vs. absent) and fζ (2-1-1 vs. 1-0-0); from *C. glifadaensis* by the shorter AM (19-25 vs. 62-70), GL (99-111 vs. 152-166), Ta I (75-82 vs. 170-174), Ti I (45-60 vs. 208-210), Ge I (44-56 vs. 160-164), Ta II (71-76 vs. 154-156), Ti II (56-65 vs. 180-184), Ge II (50-56 vs. 134-136), Ta III (76-87 vs. 174-176), Ti III (72-96 vs. 254), Ge III (60-70 vs. 160-162), fn Ge (8-8-8 vs. 13-12-12), fn Ti (12-13-13 vs. 16-18-18) and presence of Cp on Ti I and Ta I (vs. absent); from *C. dalegori* by the shorter AM (19-25 vs. 70-80), S (44-52 vs. 90-100), Ta I (75-82 vs. 184-202), Ti I (45-60 vs. 244-260), Ge I (44-56 vs. 184-204), Ta II (71-76 vs. 176-184), Ti II (56-65 vs. 210-222), Ge II (50-56 vs. 158-164), Ta III (76-87 vs. 194-204), Ti III (72-96 vs. 290-304), Ge III (60-70 vs. 176-190), fn Ti (12-13-13 vs. 18-18-18), fn Ta (22-22-22 vs. 21-18-18) and presence of Cp on Ti I and Ta I (vs. absent); from *C. kaliksti* by the shorter AM (19-25 vs. 44-46), S (44-52 vs. 88-90), Ta I (75-82 vs. 150-160), Ti I (45-60 vs. 172-184), Ge I (44-56 vs. 132-144), Ta II (71-76 vs. 146-154), Ti II (56-65 vs. 154-164), Ge II (50-56 vs. 116-126), Ta III (76-87 vs. 156-164), Ti III (72-96 vs. 206-216), Ge III (60-70 vs. 134-142), fn Ti (12-13-13 vs. 18-16-18) and fn Ta (22-22-22 vs. 19-21-19); from *C. kalithensis* by the shorter AM (19-25 vs. 34-40), Ti I (45-60 vs. 96-106), Ge I (44-56 vs. 86), Ti III (72-96 vs. 114-120), fn Ti (12-13-13 vs. 16-16-16), fn Ta (22-22-22 vs. 26-24-23), presence of Cp on Ti I and Ta I (vs. absent) and fζ (2-1-1 vs.. 2-2-0); from *C. samosensis* by the shorter AM (19-25 vs. 60), Ta I (75-82 vs. 126), Ti I (45-60 vs. 172), Ge I (44-56 vs. 148), Ta II (71-76 vs. 126), Ti II (56-65 vs. 142), Ge II (50-56 vs. 116), Ta III (76-87 vs. 146), Ti III (72-96 vs. 226), Ge III (60-70 vs. 144), fn Ti (12-13-13 vs. 18-18-18), fn Ta (22-22-22 vs. 20-18-18), presence of Cp on Ti I and Ta I (vs. absent) and fζ (2-1-1 vs. 2-0-0); from *C. saboorii* by the shorter AM (19-25 vs. 55), S (44-52 vs. 80), *1a* (12-25 vs. 69), Ta I (75-82 vs.149), Ti I (45-60 vs. 155), Ge I (44-56 vs. 129), Ta II (71-76 vs. 145), Ti II (56-65 vs. 151), Ge II (50-56 vs. 108), Ta III (76-87 vs. 158), Ti III (72-96 vs. 215), Ge III (60-70 vs. 125) and presence of Cp on Ti I and Ta I (vs. absent); from *C. nazaleae* by the shorter AM (19-25 vs. 78), S (44-52 vs. 95), W (75-81 vs. 105), L (56-96 vs. 125), Ta I (75-82 vs.

174), Ti I (45-60 vs. 267), Ta II (71-76 vs. 193), Ti II (56-65 vs. 228), Ta III (76-87 vs. 210), Ti III (72-96 vs. 323), fn Ge (8-8-8 vs. 10-12-12), fnTi (12-13-13 vs. 17-19-17) and presence of Cp on Ti I and Ta I (vs. absent); from *C. damavandica* by the shorter AM (19-25 vs. 63), S (44-52 vs. 84), TaI (75-82 vs. 116), Ti I (45-60 vs. 126), Ta II (71-76 vs. 122), Ti II (56-65 vs. 126), Ta III (76-87 vs. 137), Ti III (72-96 vs. 183), fn Ge (8-8-8 vs. 12-13-12), fn Ti (12-13-13 vs. 15-17-19) and presence of Cp on Ti I and Ta I (vs. absent) and from *C. behbahanensis* by the shorter AM (19 -25 vs. 70), S (44-52 vs. 86), Ta I (75-82 vs. 156), Ti I (45-60 vs. 186), Ta II (71-76 vs. 156), Ti II (56-65 vs. 168), Ti III (72-96 vs. 228) fn Ge (8-8-8 vs. 12-12-12), fn Ti (12-13-13 vs. 17-17-17).

Key of world larval species group of *Charletonia* with two setae between coxae II and III.

1. Ge I-III each with 8 normal setae 2
— Number of normal setae on Ge I-III otherwise . 3

2. Ti I with 13 and Ti III 14 normal setae, gnathosoma with 1 pair of hypostomalae . . . . . *C. blascoi*
— Ti I with 12 and Ti III with 13 normal setae, gnathosoma with 2 pairs of hypostomalae. . . . . *C. talebii* Sedghi, Saboori and Hakimitabar **n. sp.**

3. Ge I with 13 normal setae . . . . . *C. glifadaensis*
— Number of normal setae on Ge I otherwise 4

4. Ge II with 13 normal setae . . . . . *C. damavandica*
— Ge II with 12 normal setae 5

5. Ge III with 16 normal setae . . . . . *C. saboorii*
— Ge III with 12 normal setae 6

6. Ti II with 19 normal setae . . . . . *C. nazalae*
— Number of normal setae on Ti II otherwise 7

7. Ti III with 16 normal setae . . . . . *C. kalithensis*
— Ti III with 17-18 normal setae 8

8. Ti II with 16 normal setae . . . . . *C. kaliksti*
— Ti II with 17-18 normal setae 9

9. Ti II with 1 solenidion . . . . . *C. austiensis*
— Ti II with 2 solenidia 10

10. Ti III with 17 normal setae 11
— Ti III with 18 normal setae 12

11. Solenidion placed proximally on Ge I, companion seta on Ti I absent . . . . . *C. cugliensis*
— Solenidion placed distally on Ge I, companion seta on Ti I present . . . . . *C. behbahanenis*

12. Ge II without microseta, Ti III 226 . . *C. samoensis*
— Ge II with microseta, Ti III 290-304 . . . . *C. dalegori*

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