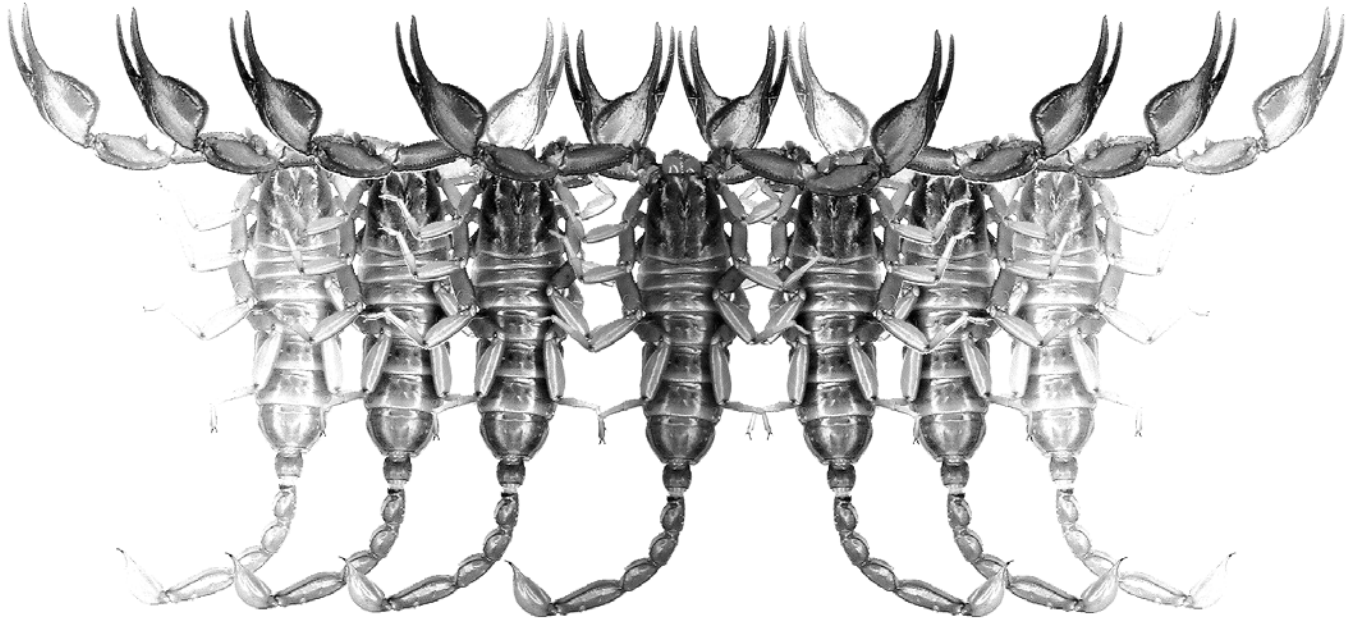


Euscorpium

Occasional Publications in Scorpiology



**A Review of the Genus *Isometrus* Ehrenberg, 1828
(Scorpiones: Buthidae) with Descriptions of
Four New Species from Asia and Australia**

František Kovařík

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Euscorpilus

Occasional Publications in Scorpiology

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- **MZUC**, Museo Zoologico "La Specola" dell'Universita de Firenze, Florence, Italy
- **ZISP**, Zoological Institute, Russian Academy of Sciences, St. Petersburg, Russia
- **WAM**, Western Australian Museum, Perth, Australia
- **NTNU**, Norwegian University of Science and Technology, Trondheim, Norway

A review of the genus *Isometrus* Ehrenberg, 1828 (Scorpiones: Buthidae) with descriptions of four new species from Asia and Australia

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Summary

Four new species of the genus *Isometrus* are described: *Isometrus (Reddyanus) bilyi* from Australia, *I. (R.) petrzekai* from Vietnam and Thailand, *I. (R.) problematicus* from India and *I. (R.) khammamensis* from India. Keys are presented to all species of both subgenera of *Isometrus*. Lectotypes are designated for *I. (I.) thurstoni* Pocock, 1893 and *I. (R.) assamensis* Oates, 1888. *I. (I.) sankariensis* Tikader & Bastawade, 1983 is synonymized with *I. (I.) thurstoni* Pocock, 1893. First time records include *I. (I.) thurstoni* Pocock, 1893 from Kerala (India), *I. (R.) assamensis* Oates, 1888 from Madhya Pradesh and West Bengal (India) and Bangladesh, *I. (R.) brachycentrus* Pocock, 1899 from Tamil Nadu (India), *I. (R.) heimi* Vachon, 1976 from New Guinea, *I. (R.) kurkai* Kovařík, 1997 from Sumatra (Indonesia), Kalimantan and Sarawak (Malaysia), *I. (R.) navaiae* Kovařík, 1998 from Indonesia and *I. (R.) rigidulus* Pocock, 1897 from Maharashtra and Rajasthan (India). *I. (R.) isadensis* Tikader & Bastawade, 1983 from India is considered a *nomen dubium*.

Introduction

In the past, I described four species of *Isometrus* (Kovařík, 1994, 1997a, 1998a) and attempted to examine as many types and other specimens as possible in order to present a hitherto unavailable key to all species of the genus. The undertaking proved difficult because, except for the cosmopolitan *I. (I.) maculatus*, species of this genus are rare in collections, some are known from only one specimen, and for some there are no males. However, by now I have seen enough material to be able to prepare a key and recognize four more species. Below I list and review all species of the genus and describe four new species.

ABBREVIATIONS. The institutional abbreviations listed below and used throughout are after Arnett et al. (1993).

BMNH – The Natural History Museum, London, UK;
CASC – California Academy of Sciences, San Francisco, California, USA;
FKCP – František Kovařík Collection, Prague, Czech Republic;
HNHM – Hungarian Natural History Museum, Budapest, Hungary;
MHNG – Muséum d'Histoire Naturelle, Geneva, Switzerland;
MNHN – Muséum National d'Histoire Naturelle, Paris, France;
MZUF – Museo Zoologico "La Specola", Florence, Italy;

NHMB – Naturhistorisches Museum, Basel, Switzerland;
NMPC – National Museum (Natural History), Prague, Czech Republic;
NHRS – Naturhistoriska Riksmuseet, Stockholm, Sweden;
NZSI – National Collection, Zoological Survey of India, Calcutta, India;
SMFD – Forschungsinstitut und Museum Senckenberg, Frankfurt a. M., Germany;
ZMHB – Museum für Naturkunde der Humboldt-Universität, Berlin, Germany;
ZMUH – Zoologisches Institut und Museum, Universität Hamburg, Germany.

Other abbreviations: ♂ - male; ♀ - female; im. - immature; juv. - juvenile.

Isometrus Ehrenberg, 1828 (Figs. 1–8, Table 1)

Buthus (Isometrus): Ehrenberg in Hemprich & Ehrenberg, 1828: pl. 1, fig. 3; Hemprich & Ehrenberg, 1829: 351; Hemprich & Ehrenberg, 1831: 3; Sundevall, 1833: 32.

Buthus: Agassiz, 1846: 7 (in part).

Lychas: C. L. Koch, 1845b: 1 (in part); C. L. Koch, 1850: 92 (in part).

Centrurus (Isometrus): Peters, 1862: 512.

Isometrus: Thorell, 1876a: 8; Karsch, 1879a: 18; Ausserer, 1880: 465; Pocock, 1890a: 119; Kraepelin, 1891: 244; Pocock, 1893b: 376; Kraepelin, 1895: 89; Pocock, 1897a: 360; Kraepelin, 1898: 4; Pocock, 1899b:

835; Kraepelin, 1899: 64; Pocock, 1900: 44; Pocock, 1902: 38; Kraepelin, 1905: 196; Kraepelin, 1905: 335; Kraepelin, 1913: 134, 182; Kraepelin, 1916: 33; Glauert, 1925: 115; Ewing, 1928: 22; Werner, 1934: 273; Pérez, 1974: 30; Vachon, 1982: 86; Tikader & Bastawade, 1983: 254; Sissom, 1990: 101; Kovařík, 1994: 201; Fet & Lowe, 2000: 146; Kovařík, 2001: 41.

Archisometrus: Kraepelin, 1891: 217 (in part).

TYPE SPECIES: *Scorpio maculatus* DeGeer, 1778

DIAGNOSIS: Trichobothrial patterns orthobothriotaxic. Dorsal trichobothria of femur arranged in beta-configuration. Tibial spurs absent on all legs. Sternum subtriangular. Movable fingers of pedipalps with six rows of granules and external and internal granules. Tibiae and tarsomeres of legs I–III with setae not arranged into bristlecombs. Carapace granulated, without carinae. Mesosoma dorsally with one median carina. Telson with subaculear tooth pointed or rounded. Total length under 70 mm.

Subgenus *Isometrus* Ehrenberg, 1829

Isometrus (Isometrus): Pocock, 1897b: 113; Vachon, 1972: 176; Vachon, 1976: 38; Vachon, 1982: 88; Kovařík, 1994: 201; Fet & Lowe, 2000: 146.

Isometrus (Raddyanus): Tikader & Bastawade, 1983: 254 (in part).

= *Isometrus (Closotrichus)* Tikader & Bastawade, 1983: 311 (syn. by Kovařík, 1994: 201).

TYPE SPECIES: *Scorpio maculatus* DeGeer, 1778

DIAGNOSIS: Trichobothrium *db* on chela of pedipalp situated between trichobothria *dt* and *et*. Males of most species have longer segments of pedipalps and metasoma than females.

Isometrus (Isometrus) formosus Pocock, 1894

Isometrus formosus Pocock, 1894: 88; Kraepelin, 1895: 89; Kraepelin, 1896: 126; Kraepelin, 1899: 67; Kraepelin, 1901: 269; Kraepelin, 1908: 190; Kopstein, 1921: 127; Kopstein, 1923: 184; Kopstein, 1926: 111; Giltay, 1931: 18; Takashima, 1945: 86; Vachon, 1972: 177; Vachon, 1976: 39; Vachon, 1982: 86.

Isometrus (Isometrus) formosus: Kovařík, 1994: 198; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 147.

TYPE LOCALITY AND TYPE REPOSITORY. Buitenzorg, Java; BMNH.

MATERIAL EXAMINED. **Indonesia**, Java, Haldumulla, Buitenzorg, 1♂, IV. 1984, det. Pocock, BMNH.

DISTRIBUTION. Indonesia (Java) (Pocock, 1894: 88), (Sumatra) (Kraepelin, 1899: 67), Singapore (Kraepelin, 1901: 269).

Isometrus (Isometrus) maculatus (DeGeer, 1778)

? = *Scorpio europaeus* Linné, 1758: 625; Fabricius, 1775: 399; Guérin-Méneville, 1843: 11 (syn. by Thorell, 1876a: 8).

= ? *Scorpio americanus* Linné, 1758: 624 (syn. by Thorell, 1876a: 8).

Scorpio americanus: Linné, 1775: 1091.

Scorpio maculatus DeGeer, 1778: 346.

= *Scorpio dentatus* Herbst, 1800: 55 (syn. by Pavesi, 1881: 537).

= *Buthus (Isometrus) filum* Ehrenberg in Hemprich & Ehrenberg, 1828: pl.1, fig. 3; Moritz & Fischer, 1980: 314; Braunwalder & Fet, 1998: 32 (syn. by Peters, 1862: 515).

= *Tityus aethiops* C. L. Koch, 1843: fig. 856; C. L. Koch, 1845a: 11 (syn. by Karsch, 1879a: 114).

= *Tityus longimanus* C. L. Koch, 1843: fig. 857; C. L. Koch, 1845a: 13 (syn. by Thorell, 1888: 330).

= *Lychas paraensis* C. L. Koch, 1845a: 6, fig. 963; Moritz & Fischer, 1980: 321 (syn. by Thorell, 1888: 406).

Lychas maculatus: C. L. Koch, 1845b: 1, fig. 960.

Lychas americanus: C. L. Koch, 1845b: 2, fig. 961; Lamoral & Reynders, 1975: 510.

= *Scorpio (Lychas) gabonensis* Lucas, 1858: 430; Lamoral & Reynders, 1975: 511 (syn. by Peters, 1862: 515).

= *Scorpio (Lychas) guineensis* Lucas, 1858: 432 (syn. by Peters, 1862: 515).

Isometrus maculatus: Simon, 1876: 219; Thorell, 1876a: 8; Oates, 1888: 250; Pocock, 1890b: 236; Pocock, 1893b: 376; Kraepelin, 1899: 66; Kraepelin, 1905: 334; Kraepelin, 1908: 183; Hirst, 1913: 32; Kraepelin, 1913: 134, 185; Kopstein, 1921: 126; Kopstein, 1923: 184; Fage, 1929: 72; Roewer, 1929: 611; Fage, 1936: 181; Fage, 1944: 71; Lamoral & Reynders, 1975: 508; Vachon, 1982: 90; Kovařík, 1997b: 362; Huber et al., 2002: 53; Soleglad & Fet, 2003: 5.

= ? *Isometrus sonticus* Karsch, 1879a: 116; Moritz & Fischer, 1980: 324 (syn. by Kraepelin, 1891: 245).

= ? *Lychas mabillianus* Rochebrune, 1884: 28; Pocock, 1891: 447 (syn. by Simon, 1886: 86).

Isometrus europaeus: Lönnberg, 1897: 180, 183; Pocock, 1898: 326; Pocock, 1899b: 835; Pocock, 1900: 46; Pocock, 1902: 38; Wu, 1936: 119; Takashima, 1945: 85; Takashima, 1948: 76; Takashima, 1950: 18.

= *Isometrus europaeus quinquefasciatus* Franganillo, 1931: 118; Franganillo, 1934: 166 (syn. by Moreno, 1940: 43).

= *Isometrus madagassus* Roewer, 1943: 217; Vachon, 1969: 417; Probst, 1973: 330; Lamoral & Reynders, 1975: 509 (syn. by Lourenco, 1996: 444).

Isometrus (Isometrus) maculatus: Vachon, 1972: 177; Vachon, 1976: 38; Kovařík, 1994: 197; Kovařík, 1995: 187; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 147; Kovařík, 2002: 8.

Isometrus (Isometrus) madagassus: Vachon, 1972: 177; Vachon, 1976: 38; Vachon, 1982: 90; Kovařík, 1994: 202.

Isometrus (Raddyanus) europaeus: Tikader & Bastawade, 1983: 286.

TYPE LOCALITY AND TYPE REPOSITORY. Suriname and Pennsylvania; NHRS.

TYPE MATERIAL EXAMINED. **Madagascar**, Tananarive, 1♂ (holotype of *Isometrus madagassus*), SMFD No. 8879/221.

OTHER MATERIAL EXAMINED. **Algeria**, Stadt, 1♀, SMFD No. 6697/104. **Argentina**, Resistencia, 1♀, leg. Balzani, MZUF. ? **Australia**, Mariannen, Saipan, 1♀, leg. Schnee, ZMHB No. 899/1911. **Australia**, Caivus, 1♂, leg. Felten, SMFD; Queensland Cooktown, 1♀, 1938, FKCP. **Brazil**, Amazonas, Manacapuru, 4♂ 3♀, VIII.1924, leg. W. Ehrhardt, SMFD; Amazonas, Manacapuru, Sdimoes, 3♂ 6♀ 1juv., VII.1924, leg. W. Ehrhardt, SMFD; Olinda (Recifo), St. Penambuco, 2♀, 24.V.1930, SMFD; Manacapuru, 1♂ 1♀, 1934, FKCP; Mendes, 100 km v. Rio in der Sierra do Mor, VII–IX.1935, 1♂, leg. Friedländer, ZMUH; Tiriyo, Maloca am, ob. Rio Parú de Oeste, 1♀, 24–30.I.1961, leg. Sattler, SMFD; 1♂1♀, leg. baron von Dungere, ZMHB No. 344D/25; Paraná, Rio Branco, 1♂, leg. Uhe, ZMHB No. 1360/1912; Alacranes Machorro, 2♂ 1♀, MZUF. **Costa Rica**, Farm Waldeck, Ebene Limon (in Hotel), 30.XI.1933, 1♂, leg. F. Nevermann, ZMUH. **Democratic Republic of Congo**, Mutskatscha Dilolo, 1931, 1♀, leg. F. Haas, SMFD; Kisangani, III.1975, 1♂, MZUF; Mombasa Haut Zaire, V–VI.1987, 1♂, leg. M. Borri, MZUF. **Ethiopia**, (Abyssinia), 1905, 1♀, ZMHB. **India**, Bombay, Mahateron, I.1873, 1♂ 1♀, leg. G. Pilastrri, MZUF; Dekan, Anamalei, 1♂ 1♀ 2juvs., SMFD No. 1086/17; Karnataka State, Mysore, 15 mi. S Chikmagalur, 900 m., 20.II.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karnataka State, Mysore, 7 mi. SE Sakleshpur, 900 m., 21.II.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Tamil Nadu State, Topslip, Anamalai Hills, 760 m, 18.III.1962, 1juv. (det.?), leg. E. S. Ross & D. Q. Cavagnaro, CASC; Tamil Nadu State, Marayoor, 27 mi NE Munnar, I.IV.1962, 1♀10juvs. before first ecdysis, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karwa, 1965, 1♀, FKCP; West Bengal State, Khalishani Dt. Howran,

10.VI.1966, 1♂, leg. Isa Santra, CASC; Meghalaya State, West Garo Hills reg., BAGMARA, 19–21.V.1996, 1♂, alt. 100±50m, GPS N25.11.5 E90.38.5 (WGS 84), leg. E. Jendek & O. Šauša, FKCP; Nandi Hills, N of Bangalore, 900–1300 m, 22.VII.1996, 1♂, leg. Werner & Lorenz, FKCP; Tamil Nadu, Nilgiri Hills, Kunchapani, X.1997, 1♀, FKCP; Tamil Nadu State, Javadu Hills, Kavalore, Vellore Dist., 1♀, 2000, coll. T.R.S.N., FKCP. **Indonesia**, Sumatra, Deli, 1♀, leg. Heyden, SMFD No. 5169; Sumatra, Atjeh (Hügellani Boeloch Blang-Asa über Iho Seumawa), 1♂, III.192?, leg. Rookmarker, SMFD. **Kenya**, (Brit. E. Africa), Mombasa, VI.1907, 1♂ 1♀, leg. Schauer, ZMHB No. 2013/07. **Madagascar**, Flot Prune by Tamatave, 1♀, leg. Dr. Friederichs, ZMHB No. ZMB 30803; Kap Diego, 1♀, leg. Dr. Friederichs, ZMHB No. ZMB 30804; Nossibé, 1898, 2♂ 4♀, leg. Ebenar, SMFD No. 5206; 1♂, 1902, FKCP. **Maldives**, Atollo Mase Sud, II.1976, 1♀ (det. ?), leg. L. Azzaroli, MZUF. **Micronesia**, Caroline Island, 1♀, MZUF. **New Guinea**, Hollandia, 1♀, leg. Mayr, ZMHB No. 47D/29. **Pakistan**, E., Baraiadhala Forest Res., 150 ft., 21.IX.1961, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Lahore, 250 m., 13.XII.1961, 1juv., leg. E. S. Ross & D. Q. Cavagnaro, CASC. **Peru**, Callanga, 1♀, FKCP. **Philippines**, Sabaan, 23.I.1916, 1♀, leg. S. Böttcher and V. Heyne, ZMHB No. 137D/24; Luzon, Manila, 21.IV.1945, 1♂, leg. T. Aarens, CASC; I.1951, 2♂ 1♀ 2juvs., leg. Terry, CASC. **Seychelles**, Mahé Island, 1juv., ZMHB. **Somalia**, Belet Amin, VII.1934, 1juv., leg. S. Patrizi, MZUF. **Surinam**, 1♂, Cardua, SMFD. **Syria**, Damascus, 1870, 1♂, leg. G. Pilastrri, MZUF. **Tanzania**, Zanzibar Island, 29.VII.1889, 1♀, ZMHB; Dar-es-Salam, Warenkiste, 6.II.1927, 1♀, ZMUH; Dar-es-Salam, 1929, 1♂ 1♀, leg. H. Brauns, ZMUH; Dar-es-Salaam, 1♂, SMFD No. 8868/210; 1♂ 1♀, FKCP. **Thailand**, Kohsamui, I.1984, 1♂, leg. E. Talenti, FKCP; Phuket, 1997, 1♀ (im.) two ecdysis (second and third), FKCP. **USA**, Hawaii, Honolulu, 2♂, SMFD No. 4942/23. **Venezuela**, San Estaban, Puerto Cabello, 1♀, 19.X.1948, leg. Schöffner, SMFD; Rancho la Grande, 1♀, II.1955, leg. R. Mertens, SMFD. **Vietnam**, Annam, Quinhon, X.1934, 1♂, MNHN RS 1537. ?, 1♀, coll. Simon, MNHN No. RS 1473; Au Bord der “Marie“, 1908, 1juv., leg. H. Merton, SMFD No. 5166; 1♂ 2♀, SMFD No. 5168; Aroe, Dobo, Wammer, 22.III.1908, 2♀ 1im., leg. H. Merton, SMFD No. 5165; Elat, Gross-key, IV.1908, 1♂, leg. H. Merton, SMFD No. 5207; Banana, Kongo-Mündung, 1885, 1♂1♀1im., leg. Hesse, SMFD No. 5124; Kawieng, 1juv., 5.IX.1909, leg. E. Wolf (Hanseatische Südsee Expedition 1909), SMFD; O. Afrika, 1♀, leg. Knippes, SMFD; Siam, Chiang-Mai, 1938, 1♀, ZMUH; 1♂ 1♀,

FKCP; Mt. Makiling, Laguna P.I., 5000 ft, 16.VIII.1932, 2♂, leg. F.C.Hadden, CASC.

DISTRIBUTION. Cosmopolitan.

COMMENTS. Records of this species are so numerous that a complete listing would be unreasonably long. The included records are a representative selection.

***Isometrus (Isometrus) thurstoni* Pocock, 1893**

Isometrus thurstoni Pocock, 1893a: 297; Kraepelin, 1895: 89; Kraepelin, 1896: 126; Kraepelin, 1899: 67; Pocock, 1900: 47; Kraepelin, 1908: 190; Kraepelin, 1913: 135; Mello-Leitao, 1934: 8; Takashima, 1945: 86.

Isometrus (Isometrus) thurstoni: Vachon, 1972: 177; Vachon, 1976: 38; Vachon, 1982: 90; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 150.

Isometrus (Raddyanus) thurstoni: Tikader & Bastawade, 1983: 273.

? = *Isometrus (Closotrichus) sankariensis* Tikader & Bastawade, 1983: 311. **Syn. n.**

Isometrus (Isometrus) sankariensis: Kovařík, 1994: 201; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 150.

TYPE LOCALITY AND TYPE REPOSITORY. India, Sheveroy Hills; BMNH.

TYPE MATERIAL EXAMINED. India, Sheveroy Hills, 1♂ (lectotype hereby designated), leg. Edgar Thurston, BMNH No. 1891.5.22.1.

OTHER MATERIAL EXAMINED. **India**, S. Coorg, III.1952, 1♂, leg. P. Susai Nathan, CASC; Tamil Nadu State, Karikal, Tanjore District, 20.IV.1951, 2♀ (im.) (det.?), leg. P. Susai Nathan, CASC; Tamil Nadu State, Karikal, Terrotory, Kurumbagaram, I.1954, 1♂, leg. P. Susai Nathan, CASC; Nilgiri Hills, Singora, 30.IX.1953, 1♀, leg. P. Susai Nathan, CASC; Nilgiri Hills, Singora, 23.V.1954, 1♀, leg. P. Susai Nathan, CASC; M Cgiri Hills, Singora, 30.IV.1954, 1♀, CASC; Tamil Nadu State, Shevary Hills, Yercau, 3.VII.1954, 1♀, 16.VII.1954, 1♂, II.1955, 1♂ 1♀, 24.II.1955, 1im., leg. P. Susai Nathan, CASC; Tamil Nadu State, Coimbatore, VI.1958, 1♀ (im.), leg. P. Susai Nathan, CASC; Tamil Nadu State, Coimbatore, XI.1961, 1♂ (im.), leg. P. Susai Nathan, FKCP; Karnataka State, Mysore, 10 mi. SW Shimoga, 600 m., 19.II.1962, 1♀ 15juvs before first ecdysis, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karnataka State, Mysore, 8 mi. W Hunsur, 800 m., 21.II.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karnataka State, Mysore, 12 mi. E Virajpet, 850 m., 24.II.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karnataka State, Mysore, 2 mi. NW Punjur, 850 m., 13.III.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Pondichery State, Karikal, Madras, XII.1962,

1♂, leg. P. Susai Nathan, CASC; Pondichery State, Karikal, Madras, IX.1963, 1♀ (im.), leg. P. Susai Nathan, CASC; West Bengal State, Calcutta, 17.VIII.1965, 1♀, leg. B. V. College, CASC; West Bengal State, 25 mi. Calcutta, 6.XI.1966, 1♂, leg. Dr. N. K. Paul, CASC; Kerala Peryar res., 1♀ (im.), 15.IV.1993, leg. P. Senft, FKCP; Kerala Munar env., Kalar wall., 2♀ (im.), 29–31.V.1994, leg. R. Sauer, FKCP; Tamil Nadu, Mudumalai N.P., 1♀, 18.VI.1994, leg. R. Sauer, FKCP; Kerala, 15 km SW Munnar, Kallar Valley, 1250 m, 10°02'N 76°58'E, 5.V.1997, 3♀ 1juv., leg. Dembický & Pacholátko, FKCP; Tamil Nadu, Nilgiri hills, 15 km SE of Kotagirl, Kunjappanai env., 76°56'E 11°22'N, ca 900 m, 22–30.V.1999, 2♂ 4♀ 4juvs., leg. Z. Kejval & M. Trýzna, FKCP; Karnataka, Coorg, 10 km SE of Virajpet, 75°46'E 12°06'N, ca 500–900 m, V.1999, 1♀, leg. Z. Kejval & M. Trýzna, FKCP.

DISTRIBUTION. India (Andhra Pradesh, Karnataka, Madhya Pradesh, Maharashtra, Tamil Nadu) (Pocock, 1893a: 299; Tikader & Bastawade, 1983: 280, Fet & Lowe, 2000: 150) (Kerala) (first record), Sri Lanka (Pocock, 1900: 48).

COMMENTS. In their description of *Isometrus sankariensis*, Tikader & Bastawade (1983) distinguished *I. thurstoni* on the position of trichobothrium *db*. My examination of the lectotype reveals the position of that trichobothrium in their Figs. 796 and 797 on p. 279 to be incorrectly drawn. It is situated between trichobothria *dt* and *et* and not between *et* and *est*. Specimens in my collection that I considered to be *I. sankariensis* (see Kovarik, 1994: 201) are immature females of *I. thurstoni*.

***Isometrus (Isometrus) thwaitesi* Pocock, 1897**

Isometrus thwaitesi Pocock, 1897b: 114; Kraepelin, 1899: 67; Pocock, 1900: 48; Lampe, 1918: 196; Takashima, 1945: 86.

Isometrus twaitesi: Vachon, 1972: 177; Vachon, 1976: 39.

Isometrus (Isometrus) thwaitesi: Vachon, 1982: 88; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 150.

Isometrus (Isometrus) thwaitesi pallidus Lourenço & Huber, 2002: 266.

TYPE LOCALITY AND TYPE REPOSITORY. Ceylon, now Sri Lanka; BMNH.

MATERIAL EXAMINED. **Sri Lanka**, Ratnapura dist., 2 km S Hayes, 30.XI.1995, 1♀, leg. S. Bečvář & Košťál, FKCP.

DISTRIBUTION. Sri Lanka (Pocock, 1897b: 114).

Subgenus *Reddyanus* Vachon, 1972
(Figs. 1–8, Table 1)

Isometrus (Reddyanus) Vachon, 1972: 177; Vachon, 1976: 38; Vachon, 1982: 90; Francke, 1985: 9; Kovařík, 1994: 202; Fet & Lowe, 2000: 150.

Isometrus (Raddyanus): Tikader & Bastawade, 1983: 255 (in part).

TYPE SPECIES: *Isometrus acanthurus* Pocock, 1899 (see Fet & Lowe, 2000: 150)

DIAGNOSIS: Trichobothrium *db* on chela of pedipalp situated between trichobothria *et* and *est*.

Males of most species have longer segments of metasoma and often also wider manus than females; segments of pedipals are of equal length in both sexes.

Isometrus (Reddyanus) acanthurus Pocock, 1899

Isometrus acanthurus Pocock, 1899a: 264; Pocock, 1900: 51; Kraepelin, 1913: 135; Takashima, 1945: 87.

Isometrus (Reddyanus) acanthurus: Vachon, 1972: 177; Vachon, 1976: 39; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 150.

Isometrus (Raddyanus) acanthurus: Tikader & Bastawade, 1983: 299.

Isometrus (Raddyanus) acanthurus acanthurus: Kovařík, 1994: 202; Kovařík, 1997a: 8; Fet & Lowe, 2000: 151.

TYPE LOCALITY AND TYPE REPOSITORY. Matheran; BMNH.

TYPE MATERIAL EXAMINED. **India**, Matheran, 1♂ (holotype), BMNH No. 1897.9.17.90.

OTHER MATERIAL EXAMINED. **India**, Panvel, 2♂3♀, 1985, FKCP.

DISTRIBUTION. India (Maharashtra) (Pocock, 1899a: 264).

Isometrus (Reddyanus) assamensis Oates, 1888

Isometrus assamensis Oates, 1888: 250; Kraepelin, 1896: 126; Kraepelin, 1899: 67; Pocock, 1900: 48; Kraepelin, 1913: 135; Takashima, 1945: 86; Pérez, 1974: 30.

Isometrus (Reddyanus) assamensis: Vachon, 1972: 177; Vachon, 1976: 38; Vachon, 1982: 100; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 151.

Isometrus (Raddyanus) assamensis: Tikader & Bastawade, 1983: 292.

TYPE LOCALITY AND TYPE REPOSITORY. Dhubri in Assam, India; BMNH.

TYPE MATERIAL EXAMINED. **India**, Assam State, Dhubri, 1♂ (lectotype hereby designated) 1♂ 4♀ (paralectotypes), leg. E. W. Oates, BMNH No. 1889.7.31.76–77.

OTHER MATERIAL EXAMINED. **Bangladesh**, Jalchatra Mission, Madhupur, Tanjal, I.VII.1982, 1♀, leg. J. Homerich, FKCP. **India**, Uttar Pradesh, Dehra Dun, 700 m, 9.XII.1961, 2♂ 2♀ (im.) 2juvs., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Uttar Pradesh, Kanpur, 150 m, 28.XI.1961, 1♀ (im.), leg. E. S. Ross & D. Q. Cavagnaro, CASC; Uttar Pradesh, 5 mi SW Dehra Dun, 600 m, 9.XII.1961, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Madhya Pradesh, 14 mi S Kanker, 460 m., 31.I.1962, 1♀(im.), leg. E. S. Ross & D. Q. Cavagnaro, CASC; Uttar Pradesh, Timli Siwalik, 1♂, FKCP; West Bengal State, Calcutta, 1♂, FKCP. **Nepal**, Nerayangarh, VII.1980, 2♀, FKCP; Bhairawa, 4.VII.1981, 1♀, leg. P. Beron, FKCP.

DISTRIBUTION. Bangladesh (first record), India (Assam, Uttar Pradesh) (Oates, 1888: 250; Tikader & Bastawade, 1983: 299) (Madhya Pradesh, West Bengal) (first record), Nepal (Kraepelin, 1913: 137).

Isometrus (Reddyanus) basilicus Karsch, 1879

Isometrus basilicus Karsch, 1879a: 113; Ausserer, 1880: 467; Simon, 1884: 46; Oates, 1888: 248; Kraepelin, 1896: 127; Kraepelin, 1899: 68; Pocock, 1899a: 264; Pocock, 1900: 49; Kraepelin, 1908: 190; Kraepelin, 1913: 135; Takashima, 1945: 86; Vachon, 1972: 177; Vachon, 1976: 39; Moritz & Fischer, 1980: 310; Kovařík, 1997b: 362.

Archisometrus basilicus: Kraepelin, 1891: 220.

Isometrus (Reddyanus) basilicus: Vachon, 1982: 91; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 151.

TYPE LOCALITY AND TYPE REPOSITORY. Ceylon, now Sri Lanka; ZMHB.

TYPE MATERIAL EXAMINED. **Sri Lanka**, Ceylon, 1♂ (holotype), leg. Nietner, ZMHB No. 113.

OTHER MATERIAL EXAMINED. **Sri Lanka** (Ceylon), North Central prov., Mihintale, 1♀(im.), IV.1994, leg. P. Senft, FKCP; Kandy, IV.2001, 1♀, leg. V. Šejna, FKCP.

DISTRIBUTION. Sri Lanka (Karsch, 1879a: 113).

Isometrus (Reddyanus) besucheti Vachon, 1982

Isometrus (Reddyanus) besucheti Vachon, 1982: 93; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 151; Lourenço & Huber, 2002: 267; Huber et al., 2002: 53.

TYPE LOCALITY AND TYPE REPOSITORY. Ambagaswewa, Sri Lanka; MHNG.

DISTRIBUTION. Sri Lanka (Vachon, 1982: 93).

***Isometrus (Reddyanus) bilyi* sp. n.**
(Fig. 7, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **Australia**, Queensland, Kuranda; FKCP.

TYPE MATERIAL. **Australia**, Queensland, Kuranda, 20.II.2000, 1♀ (holotype), leg. S. Bílý, FKCP. No other material.

ETYMOLOGY. Named after Svatopluk Bílý of Prague, who collected the type specimen.

DIAGNOSIS: Total length about 26 mm (female). Pedipalps and legs yellow, only fingers of pedipalps with black spot. First three metasomal segments yellow, fourth segment reddish brown, fifth segment black. First metasomal segment bears 10 carinae, second through fourth segments bear eight carinae, fifth segment bears five carinae. Telson elongate, with one ventral median carina. Subaculear tooth triangular, dorsally with one pair of granules and one terminal granule. Pectinal teeth number 12.

DESCRIPTION: The total length of the female holotype is 26.1 mm. A color photo of the holotype is in Kovařík (in press). Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There are 12 teeth in the pecten. For the position and distribution of trichobothria on the chela of the pedipalps see Fig. 7. The male is unknown.

COLORATION: The base color is yellow. The chelicera is yellow with one small dark spot near the anterior margin. The carapace and mesosoma are dominantly black, with a weak yellow pattern. The ventral side of the mesosoma is yellow and lacks spots. The femur, patella and manus of pedipalps and legs are yellow, only the fingers bear a black spot. The first three metasomal segments are yellow, the fourth segment is reddish brown, and the fifth segment is black.

MESOSOMA AND CARAPACE: The carapace lacks carinae but bears large granules. The mesosoma bears one median carina and is granulated. The ventral side of the seventh segment is smooth, without carinae.

METASOMA AND TELSON: The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment bears five carinae. The telson is elongate, with one ventral median carina. The subaculear tooth is triangular, dorsally with one pair of granules and one terminal granule. Each dorsal

metasomal carina terminates in a tooth which is no larger than preceding granules.

PEDIPALPS: The femur and patella bear complete carinae and are granulated. The manus is smooth, without carinae. The sixth cutting edge of the movable fingers bears one external granule.

LEGS: The femur and patella bear complete carinae and are granulated. The legs are hirsute and without bristle-combs.

AFFINITIES. The described features distinguish *I. bilyi* sp. n. from all other species of the genus. They are recounted in the key below. The most similarly colored species is *I. krasenskyi* Kovařík, 1998 from Java, which however has more granules on the dorsal surface of the subaculear tooth. *I. bilyi* sp. n. has the femur and patella of pedipalp and legs yellow, without spots, which easily distinguishes it from *I. melanodactylus* that also lives in Australia, even near the type locality of the new species.

***Isometrus (Reddyanus) brachycentrus* Pocock, 1899**

Isometrus brachycentrus Pocock, 1899a: 263; Pocock, 1900: 50; Takashima, 1945: 86.

Isometrus (Reddyanus) brachycentrus: Vachon, 1972: 177; Vachon, 1976: 39; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152.

Isometrus (Raddyanus) brachycentrus: Tikader & Bastawade, 1983: 268.

TYPE LOCALITY AND TYPE REPOSITORY. Mangalore, India; BMNH.

TYPE MATERIAL EXAMINED. **India**, Kanara, 2♀ (paratypes), leg. T. R. D. Bell, BMNH No. 1897.11.5.2–3.

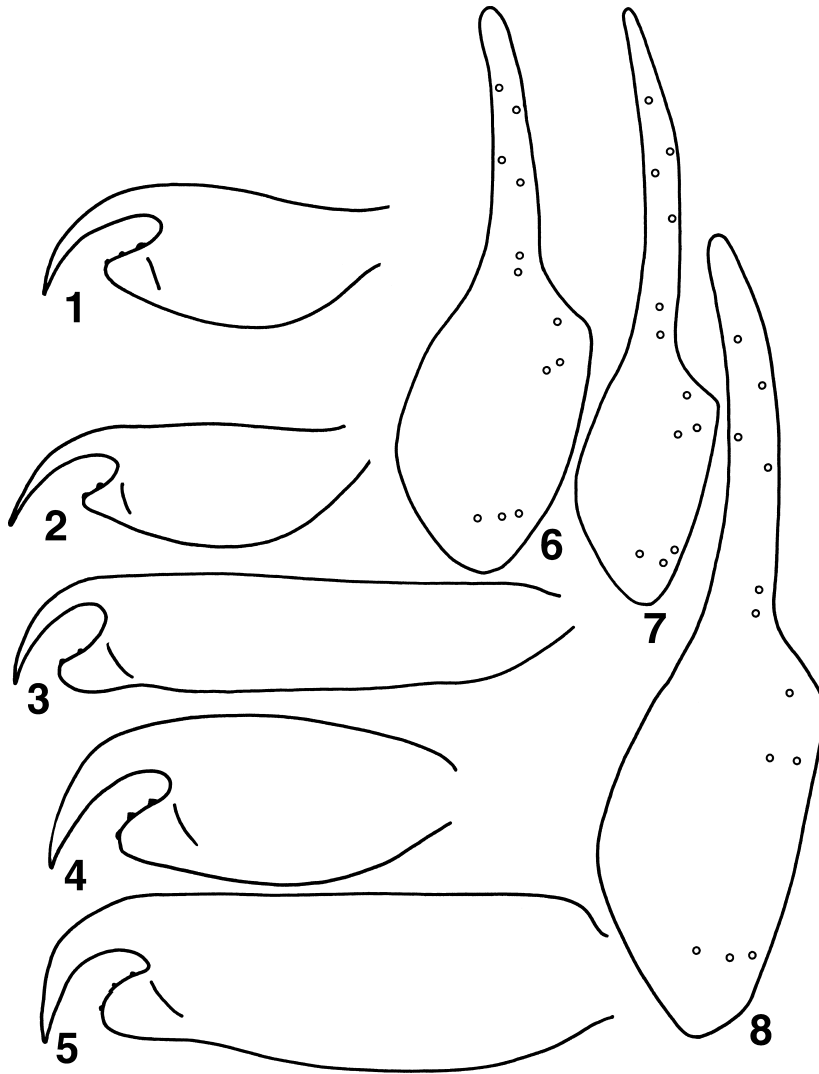
OTHER MATERIAL EXAMINED. **India**, Karnataka State, Mysore, 7 mi. SW Virajpet, 650 m., 22.II.1962, 1♂ 5♀ 2juvs., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Tamil Nadu State, Topslip, Anamalai Hills, 760 m, 18.III.1962, 1♀ 1juv., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Karnataka State, Coorg, 10 km SE of Virajpet, 75°46'E 12°06'N, 500–900 m, V.1999, 2♂ 1♀, leg. Z. Kejval & M. Trýzna, FKCP.

DISTRIBUTION. India (Karnataka, Kerala) (Pocock, 1899a: 264; Tikader & Bastawade, 1983: 268) (Tamil Nadu) (first record).

***Isometrus (Reddyanus) corbeti* Tikader & Bastawade, 1983**

Isometrus (Raddyanus) corbeti Tikader & Bastawade, 1983: 305.

Isometrus (Reddyanus) corbeti: Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152.



Figures 1–8: Figs. 1–5. Telson. 1. *I. problematicus* sp. n., female holotype. 2. *I. khammamensis* sp. n., female allotypic paratype. 3. *I. khammamensis* sp. n., male holotype. 4. *I. petzelkai* sp. n., female allotypic paratype. 5. *I. petzelkai* sp. n., male holotype. Figs. 6–8. Chela of pedipalp. 6. *I. problematicus* sp. n., female holotype. 7. *I. bilyi* sp. n., female holotype. 8. *I. petzelkai* sp. n., female allotypic paratype.

TYPE LOCALITY AND TYPE REPOSITORY. Corbet National Park, Pauri District, Uttar Pradesh, India NZSI.

DISTRIBUTION. India (Uttar Pradesh) (Tikader & Bastawade, 1983: 310).

COMMENTS. This species is placed in the key solely on the basis of characters given in the original description, which however contains several contradictions and does not quite agree with the figures. Verification of the status is therefore needed.

***Isometrus (Reddyanus) garyi* Lourenço & Huber, 2002**

Isometrus (Reddyanus) garyi Lourenço & Huber, 2002: 270.

TYPE LOCALITY AND TYPE REPOSITORY. Sri Lanka, Mannar District, beside an irrigation canal, Madhu Road; MHNG.

DISTRIBUTION. Sri Lanka (Lourenço & Huber, 2002: 270).

***Isometrus (Reddyanus) heimi* Vachon, 1976**

Isometrus (Reddyanus) heimi: Vachon, 1976: 30; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152.

TYPE LOCALITY AND TYPE REPOSITORY. New Caledonia; MNHN.

MATERIAL EXAMINED. **New Guinea**, Madang Prov., Nagada Harbor, Riwo Village, 1 km NW of Jais Aben Resort, 2 m., 7.III.1989, 1♀(im.), leg. D. H. Kavanaugh & G. E. Ball, CASC; Madang Prov., Nagada Harbor, Riwo Village, 1 km NW of Jais Aben Resort, 2 m., 18.III.1989, 1♂, leg. D. H. Kavanaugh & G. E. Ball, CASC; Madang Prov., 4.3 km NW of Awar on Awar-

		<i>I. bilyi</i> female holotype	<i>I. khammamensis</i> male holotype	<i>I. khammamensis</i> female allotype	<i>I. petrzekai</i> male holotype	<i>I. petrzekai</i> female allotype	<i>I. problematicus</i> female holotype
Total	length	26.1	38.9	28.1	47	37.1	22
Carapace	length	3.2	3.0	2.9	4.3	4.1	2.7
	width	2.9	2.3	2.5	4.0	4.1	2.8
Metasoma & telson	length	15.2	25.4	15.8	32.3	20.6	12.9
	segment I	length	1.8	3.4	1.9	3.7	2.4
segment II	width	1.5	0.9	1.1	1.4	1.9	1.5
	length	2.2	3.7	2.4	4.9	3.0	1.8
segment III	width	1.3	0.9	0.9	1.6	1.6	1.4
	length	2.4	4.4	2.7	5.5	3.4	2.0
segment IV	width	1.3	0.8	0.9	1.5	1.5	1.4
	length	2.8	4.8	2.9	6.3	3.9	2.2
segment V	width	1.2	0.8	0.9	1.4	1.5	1.4
	length	3.3	5.3	3.4	7.4	4.5	3.0
telson	width	1.2	0.8	0.9	1.5	1.5	1.4
	length	2.7	3.8	2.5	4.5	3.4	2.4
Pedipalp femur	length	2.4	2.5	2.2	4.2	3.6	2.2
	width	0.9	0.8	0.8	1.1	1.2	0.7
patella	length	3.2	3.4	2.9	4.7	4.2	2.7
	width	1.2	1.1	1.1	1.7	1.6	1.1
tibia	length	4.9	4.8	4.3	7.8	6.6	4.6
	width	1.0	1.0	1.0	1.9	1.6	1.4
finger mov.	length	3.2	2.6	2.4	3.9	3.8	2.5
Pectinal teeth		12:12	13:14	13:14	14:14	13:13	12:12

Table 1: Measurements (mm) of the type specimens of the new *Isometrus* species.

Bok Road, 5 m., 23.IV.1989, 1juv., leg. D. H. Kavanaugh & G. E. Ball, CASC; 1979, 2♂ 3♀, FKCP.

DISTRIBUTION. Oceania (New Caledonia) (Vachon, 1976: 30), New Guinea (first record).

***Isometrus (Reddyanus) isadensis* Tikader & Bastawade, 1983, nomen dubium**

Isometrus (Reddyanus) isadensis Tikader & Bastawade, 1983: 280.

Isometrus (Reddyanus) isadensis: Kovařík, 1994: 202.

Isometrus (Isometrus) isadensis: Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 147.

TYPE LOCALITY AND TYPE REPOSITORY. Moshi river near Isad vill., Gangakhed, Aurangabad, Maharashtra, India; NZSI.

COMMENTS. This species was described in the subgenus *Reddyanus* (misspelled *Raddyanus* [sic]) because of the position of trichobothrium *db* (see fig. 817 in Tikader & Bastawade, 1983: 285), which Tikader & Bastawade (1983: 286) used to place also *Isometrus europaeus* (Linné, 1758) (= *Isometrus maculatus* (DeGeer, 1778)) in that subgenus. Without seeing the types, this and other

incorrect information in that work would cause me to place the species in the subgenus *Isometrus*. This is primarily due to Fig. 814 of Tikader & Bastawade (1983: 285), which is a rendition of a male showing sexual dimorphism characteristic of the subgenus *Isometrus*, i.e. segments of pedipalp longer than in the female. Unless it becomes possible to examine the types, it is fruitless to speculate which characters given in the description are correct or erroneous. Since according to the description this species differs from all known species of the subgenus *Reddyanus* in sexual dimorphism and from all species of the subgenus *Isometrus* in the position of trichobothrium *db*, the only option available to me is to consider it a *nomen dubium*.

***Isometrus (Reddyanus) khammamensis* sp. n.**
(Figs 2 and 3, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **India**, Andhra Pradesh, 4 mi. W Khammam, CASC.

TYPE MATERIAL. **India**, Andhra Pradesh, 4 mi. W Khammam, 100 m., 7.II.1962, 2♂ 5♀ (holotype and paratypes) A, leg. E. S. Ross & D. Q. Cavagnaro. Holotype, allotypic paratype and three paratypes are in CASC. Two paratypes (1♂ 1♀) are in FKCP.

ETYMOLOGY. Named after the type locality.

DIAGNOSIS: Total length of males 32–38.9 mm, of females about 28 mm. Male has longer metasomal segments and telson. Segments of pedipalps approximately same length and width in both sexes. Pedipalps and legs yellow, with several small brown spots. Femur of pedipalps mostly yellow, patella mostly black. Manus of pedipalps yellow without spots, fingers black. Metasoma yellow with brown spots namely in female, fifth segment darker than preceding. First metasomal segment bears 10 carinae, second through fourth segments bear eight carinae, fifth segment bears five carinae in both sexes. Terminal tubercle of each dorsal carina on first, second and fourth metasomal segments of both sexes scarcely larger than preceding tubercles, on third segment of male terminal tubercle more enlarged. Telson very elongate in male, shorter in female. Subaculear tooth large, rounded, dorsally with one pair of granules and one terminal granule. Pectinal teeth number 12–15 in both sexes.

DESCRIPTION: The total length of males is 32–38.9 mm, that of females about 28 mm. A color photo of the holotype and paratype is in Kovařík (in press). Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There are 12–15 pectinal teeth in the both sexes. Sexual dimorphism is manifested primarily in the length of the metasomal segments and telson (see Figs. 2 and 3 and Table 1).

COLORATION: The base color is yellow, with brown spots. The chelicera is anteriorly reticulated and black spots are present on the fingers. The carapace and mesosoma are dominantly black with a yellow pattern. The ventral side of the mesosoma and of pedipalps is yellow without spots. The pedipalps are spotted. The femur of pedipalps is mostly yellow and the patella is mostly black. A large black spot covers nearly the entire femur. The manus of pedipalps is light yellow without spots, and the fingers are black. Legs have the same color and pattern as the femur of pedipalps. The first to fourth metasomal segments of males are yellow to yellowish brown. Most of the male fifth metasomal segment (except the anterior margin) and telson are reddish brown. The female has yellow metasomal segments with several dark spots and a larger dark spot on the fifth segment.

MESOSOMA AND CARAPACE: The carapace is without carinae but with large granules. The mesosoma bears one median carina and is granulated. The ventral side of the seventh segment bears two or four carinae and is granulated.

METASOMA AND TELSON: The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment bears five carinae in both

sexes. The terminal tubercle of each dorsal carina on the first, second and fourth segments of both sexes is scarcely larger than the preceding tubercles, whereas on the third segment of male the terminal tubercle is more enlarged. The telson is very elongate in males and shorter in females (Figs 2 and 3). The subaculear tooth is large, rounded, and dorsally with one pair of granules and one terminal granule.

PEDIPALPS: The femur and patella bear complete carinae and are granulated. Complete dorsal carinae are present also on the manus of both sexes. The sixth cutting edge of the movable fingers bears one external granule.

LEGS: The femur and patella bear complete carinae and are granulated. The legs are hirsute and without bristlecombs.

AFFINITIES. The described features distinguish *I. khammamensis* sp. n. from all other species of the genus. They are recounted in the key below. The female is morphologically closest to *I. kurkai* Kovařík, 1997 (male is not known), from which it differs in having a rounded and much wider subaculear tooth. Another related species is *I. assamensis* Oates, 1888, which however has a shorter and narrower telson, a bluntly pointed subaculear tooth, and the femur and patella of pedipalps similarly colored yellow with some black spots.

***Isometrus (Reddyanus) krasenskyi* Kovařík, 1998**

Isometrus (Reddyanus) krasenskyi Kovařík, 1998a: 35; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152.

TYPE LOCALITY AND TYPE REPOSITORY. Java, Indonesia; FKCP.

TYPE MATERIAL EXAMINED. **Indonesia**, Java, 1980, 1♀ (holotype), FKCP.

DISTRIBUTION. Indonesia (Java) (Kovařík, 1998a: 35).

***Isometrus (Reddyanus) kurkai* Kovařík, 1997**

Isometrus (Reddyanus) kurkai Kovařík, 1997a: 5; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152.

TYPE LOCALITY AND TYPE REPOSITORY. Indonesia, Java, Tigenter, Mündung; NHMB.

TYPE MATERIAL EXAMINED. **Indonesia**, Java, Tigenter, Mündung, 6.VIII.1969, leg. R. Schenkel, 1♀ (holotype), NHMB.

OTHER MATERIAL EXAMINED. **Indonesia**, North Sumatra, Bukit Lawang, W. from Medan, 10–11.IV.1993, 1juv., leg. S. Bečvář, FKCP; Borneo (Kalimantan), Nanga Pinoh District, Tontang, 1 juv. after first ecdysis, 26.VII.1994, leg. R. Dunda, FKCP. **Malaysia**, Sarawak, R. Ugap., Distr. Kapit, 1 juv. after

R. Ugap., Distr. Kapit, 1 juv. after first ecdysis, 3–9.III.1994, leg. P. Bílek, FKCP.

DISTRIBUTION. Indonesia (Java) (Kovařík, 1997a: 5) (Sumatra) (first record), (Kalimantan) (first record), Malaysia (Sarawak) (first record).

***Isometrus (Reddyanus) loebli* Vachon, 1982**

Isometrus (Reddyanus) acanthurus loebli Vachon, 1982: 98; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1998b: 111; Fet & Lowe, 2000: 151.

Isometrus (Reddyanus) loebli: Lourenço & Huber, 2002: 267.

TYPE LOCALITY AND TYPE REPOSITORY. Kandy, Sri Lanka; MNHN.

DISTRIBUTION. Sri Lanka (Vachon, 1982: 98).

***Isometrus (Reddyanus) melanodactylus* (L. Koch, 1867)**

Lychas melanodactylus L. Koch, 1867: 239; Thorell, 1876b: 123; Weidner, 1959: 102.

Isometrus melanodactylus: Kraepelin, 1891: 248; Thorell, 1893: 369; Kraepelin, 1896: 126; Kraepelin, 1899: 68; Kraepelin, 1901: 269; Werner, 1902: 599; Kraepelin, 1908: 187; Kraepelin, 1916: 33; Glauert, 1925: 116; Roewer, 1943: 217; Takashima, 1945: 86; Glauert, 1963: 183; Vachon, 1972: 177; L. E. Koch, 1977: 155; L. E. Koch, 1981: 877; Lockett, 1990: 79.

= *Isometrus melanophysa* [sic]: Keyserling, 1885: 3 (syn. by Kraepelin, 1891: 248).

= *Isometrus gracilis* Thorell, 1876b: 139 (syn. by Keyserling, 1885: 3).

= *Isometrus papuensis* Werner, 1916: 88; Lampe, 1918: 187, 196; Takashima, 1945: 87 (syn. by L. E. Koch, 1977: 156).

= *Isometrus melanodactylus inflatus* Glauert, 1925: 117 (Syn. by L. E. Koch, 1977: 156).

? *Isometrus formosus*: Takashima, 1948: 80; Takashima, 1950: 18.

Isometrus papuanus: Vachon, 1972: 177.

Isometrus (Reddyanus) melanodactylus: Vachon, 1976: 38; Francke & Lourenco, 1991: 199; Kovařík, 1994: 202; Kovařík, 1997a: 8; Kovařík, 1997b: 362; Kovařík, 1998a: 36; Kovařík, 1998b: 111; Fet & Lowe, 2000: 152; Kovařík, 2002: 8.

Isometrus (Reddyanus) papuensis: Vachon, 1976: 39.

TYPE LOCALITY AND TYPE REPOSITORY. Brisbane, Australia; ZMUH.

MATERIAL EXAMINED. **Australia**, Brisbane, 1882, 1♀, leg. Vimercati, MZUF; Winton, 1♂, No. 6698/105,

SMFD; Queensland, 10 mi. S. Tully, 20 m, 11.XI.1962, 1 juv., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Queensland, 26 mi. S. W. Sarina, 220 m, 19.XI.1962, 1♀ 13juvs. before first ecdysis, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Queensland, 10 mi. S. Ban Ban, 200 m, 22.XI.1962, 1juv., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Queensland, 4 mi. N. Yarraman, 23.XI.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Queensland, 15 mi. W. Brisbane, 400 m, 24.XI.1962, 1♀ 1juv., leg. E. S. Ross & D. Q. Cavagnaro, CASC; Queensland, 22 km S. Canungra, 610 m, 21.VII.1992, 1♀, leg. C.A. Griswold, CASC; Queensland, Fals-Rewenscho, 2000, 1♂ 1♀ 14 juvs before first ecdysis, leg. L. Hovorka, FKCP; Queensland, Kuranda, 20.II.2000, 1♀, leg. S. Bílý, FKCP.

DISTRIBUTION. Australia (L. Koch, 1867: 240), New Guinea (Lampe, 1918: 187, 196), Renell Island (Melanesia) (Francke & Lourenco, 1991: 199).

***Isometrus (Reddyanus) navaiae* Kovařík, 1998**

Isometrus (Reddyanus) navaiae Kovařík, 1998a: 37; Kovařík, 1998b: 112; Fet & Lowe, 2000: 153.

TYPE LOCALITY AND TYPE REPOSITORY. Philippines, S. Mindanao, Port Banga; ZMHB.

TYPE MATERIAL EXAMINED. **Philippines**, S. Mindanao, Port Banga, V.1915, 2♀ (holotype and paratype No. 1), ZMBH, 2♀ (paratypes Nos. 2 and 3), FKCP, leg. S. Böttcher & V. Heyne; N. Mindanao, Kolambugan, I.1905, 1♀ 1juv. (paratypes Nos. 4–5), leg. S. Böttcher & V. Heyne, ZMBH; Luzon, Banakao, 2000 m, 25.IV.1914, 1♀ (paratype No. 6), leg. S. Böttcher & V. Heyne, ZMBH.

OTHER MATERIAL EXAMINED. **Indonesia**, Mboera, West Flores, 1♂, 1965, FKCP.

DISTRIBUTION. Indonesia (first record), Philippines (Kovařík, 1998a: 37).

***Isometrus (Reddyanus) petrzeltkai* sp. n.**

(Figs 4, 5, and 8, Table 1)

? *Isometrus vittatus*: Fage, 1933: 28; Fage, 1936: 181; Fage, 1944: 71; Takashima, 1945: 87.

? *Isometrus (Reddyanus) vittatus*: Vachon, 1976: 39 (in part) and 42; Fet & Lowe, 2000: 153.

Isometrus (Reddyanus) vittatus: Kovařík, 1994: 202 (in part); Kovařík, 1995: 188 (in part); Kovařík, 1997a: 9 (in part); Kovařík, 1998a: 37; Kovařík, 1998b: 112 (in part); Kovařík, 2001: 86.

? *Isometrus basilicus*: Le Xuan Hue et al., 1998: 7.

TYPE LOCALITY AND TYPE REPOSITORY. **Vietnam**, 80 km NNE Saigon, prov. Dong Nai, valley Ma Da, Tri An dam; FKCP.

TYPE MATERIAL. **Vietnam**, prov. Dong Nai, 80 km NNE Saigon, valley Ma Da, Tri An dam, 1♀ (allotypic paratype), 27.IV.1996, 2♂ (holotype and paratype), III.1998, leg. K. Petrželka, FKCP. **Thailand**, 20 mi. SE Chantaburi, 75 m., 1.VIII.1962, 1♂ (paratype), leg. E. S. Ross & D. Q. Cavagnaro, CASC.

ETYMOLOGY. Named after Karel Petrželka of Prague, who spent several years in Vietnam and collected the type specimens.

DIAGNOSIS: Total length 45 to 58 mm (males) and 37 mm (female). Male has longer metasomal segments and telson. Segments of pedipalps approximately same length in both sexes. Pedipalps and legs yellow with several small brown spots. Manus of pedipalps yellow, fingers black. Metasoma yellow with small brown spots namely in female, fifth segment darker than preceding. First metasomal segment bears 10 carinae, second through fourth segments bear eight carinae, fifth segment smooth, with only one ventral median carina in males and five carinae in females. Each dorsal metasomal carina terminates in a tooth that on first three segments of males may be somewhat larger than preceding granules. Telson elongate in males, shorter in females. Subaculear tooth large, rounded, dorsally with two pairs of granules and one median granule. Pectinal teeth number 13–16.

DESCRIPTION: The total length is 47 mm in the male holotype and 37.1 mm in the female allotype. A color photo of the holotype and paratype is in Kovářík (in press). Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There are 13–16 pectinal teeth in the males and 13 in the female. For the position and distribution of trichobothria on the chela of pedipalps see Fig. 8. Sexual dimorphism is manifested primarily in the length of the metasomal segments and telson (see Figs. 4 and 5 and Table 1).

COLORATION: The base color is yellow with brown spots. The chelicera is posteriorly reticulated and anteriorly as black as much of the fingers. The carapace and mesosoma are dominantly black with a yellow pattern that forms two incomplete longitudinal strips. The ventral side of the mesosoma and of pedipalps is yellow without spots. The femur and patella of pedipalps are dorsally and laterally yellow with several small brown spots. The manus of pedipalps is yellow and fingers are black. The legs have the same color and pattern as the femur and patella of pedipalps. The first to fourth metasomal segments of males are yellow to yellowish brown. Most of the male fifth metasomal

segment (except the anterior margin) and telson are reddish brown. The female and the smallest male (CASC paratype) have yellow metasomal segments with several small dark spots and a larger dark spot on the fifth segment.

MESOSOMA AND CARAPACE: The carapace is without carinae but with large granules. The mesosoma bears one median carina and is granulated. The ventral side of the seventh segment bears two or four carinae and is granulated.

METASOMA AND TELSON: The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment of males is smooth, with only one ventral median carina. This carina is present also on the telson, and on the first four metasomal segments is indicated as a dark line and several granules between the two ventral carinae. The fifth metasomal segment of the female bears five carinae. Each of the dorsal metasomal carinae terminates in a tooth that on the first three segments of males is somewhat larger than the preceding granules. The telson is elongate in males and shorter in the female (Figs. 4 and 5). The subaculear tooth is rounded, dorsally with two pairs of granules and one median granule.

PEDIPALPS: The femur and patella bear complete carinae and are granulated. Incomplete dorsal carinae are present also on the manus of both sexes. The sixth cutting edge of the movable fingers bears one external granule.

LEGS: The femur and patella bear complete carinae and are granulated. The legs are hirsute and without bristle-combs.

AFFINITIES. The described features distinguish *I. petrzelkai* sp. n. from all other species of the genus. They are recounted in the key below. Morphologically closest is *I. brachycentrus* Pocock, 1899 from India, which differs in darker coloration of namely metasomal segments, a shorter male telson, incompleteness of two ventral parallel carinae on the first three metasomal segments, and their absence on the fourth and fifth segments. *I. petrzelkai* sp. n. has these carinae well developed on the first four metasomal segments. I suspect in the past this species has frequently been mistaken for *s. I. vittatus*, which however has a different coloration (the fifth metasomal segment is yellow), subaculear tooth with only one pair of granules and one terminal granule, and differs in a number of other characters.

Isometrus (Reddyanus) problematicus sp. n.

(Figs 1 and 6, Table 1)

TYPE LOCALITY AND TYPE REPOSITORY. **India**, south, Pondichery State, Karaikal; FKCP.

TYPE MATERIAL. **India**, south, Pondichery State, Karaikal, T.R.S.N. coll., 2002, 1♀ (holotype), FKCP; south, Tamil Nadu State, Coimbatore, IX.1957, 1♀ (paratype), leg. P. Susai Nathan, CASC (Stahnke collection); Nilgiri Hills, Kallas, XI.1958, 1♀ (paratype), leg. P. Susai Nathan, CASC (Stahnke collection).

ETYMOLOGY. The name reflects past identification problems (see affinities).

DIAGNOSIS: Total length 22 mm (female). Pedipalps, legs and metasomal segments yellow to reddish brown with black spots. First metasomal segment bears 10 carinae, second through fourth segments bear eight carinae, fifth segment bears five carinae. Telson bulbous, without carinae. Subaculear tooth large, obliquely triangular, dorsally with three pairs of granules. Pectinal teeth number 9–12.

DESCRIPTION: The total length of the female holotype is 22 mm. Measurements of the carapace, telson, segments of the metasoma and segments of the pedipalps, and numbers of pectinal teeth are given in Table 1. There are 12 teeth in the pecten. The paratypes have 9–10 pectinal teeth. For the position and distribution of trichobothria on the chela of pedipalps see Fig. 6. The male is unknown.

COLORATION: The chelicera is reticulated. The carapace and mesosoma are dominantly black with a weak yellow pattern. The femur, patella and chela of pedipalps, legs and metasomal segments are yellow to reddish brown with black spots.

MESOSOMA AND CARAPACE: The carapace is without carinae but bears large granules. The mesosoma bears one median carina and is granulated. The ventral side of the seventh segment bears four carinae and is granulated.

METASOMA AND TELSON: The first segment bears 10 carinae, the second through fourth segments bear eight carinae, and the fifth segment bears five carinae. The telson is bulbous, without carinae. The subaculear tooth is large, obliquely triangular, dorsally with three pairs of granules (Fig. 1).

PEDIPALPS: The femur and patella of pedipalps bear complete carinae and are weakly granulated. The manus of pedipalps is smooth, with only traces of carinae and several granules. The sixth cutting edge of movable fingers bears one external granule.

LEGS: The femur and patella bear complete carinae and are granulated. The legs are hirsute and without bristlecombs.

AFFINITIES. The described features distinguish *I. problematicus* sp. n. from all other species of the genus. They are recounted in the key below. The most similar species is *I. basilicus* Karsch, 1879 from Sri Lanka, from which *I. problematicus* sp. n. can be easily separated by smaller size and shorter/broader metasomal segments.

One of the paratypes was originally labeled *I. basilicus*. The other paratype was labeled as *I. brachycentrus*, whose juveniles may be mistaken for *I. problematicus* sp. n. although they have markedly narrower manus of pedipalps and their legs and metasomal segments are conspicuously spotted in a way different from adults of *I. brachycentrus*.

Isometrus (Reddyanus) rigidulus Pocock, 1897

Isometrus rigidulus Pocock, 1897b: 113; Kraepelin, 1899: 66; Pocock, 1900: 52; Takashima, 1945: 85; Pérez, 1974: 30.

Isometrus (Reddyanus) rigidulus: Vachon, 1972: 177; Vachon, 1976: 39; Kovařík, 1994: 202; Kovařík, 1997a: 9; Kovařík, 1998a: 36; Kovařík, 1998b: 112; Fet & Lowe, 2000: 153.

Isometrus (Raddyanus [sic]) *rigidulus*: Tikader & Bastawade, 1983: 262.

TYPE LOCALITY AND TYPE REPOSITORY. Bhopal, now Madhya Pradesh, India; BMNH.

TYPE MATERIAL EXAMINED. Burma, leg. H. M. Phipson, 1♀ (holotype), BMNH No. 1893.12.20.4.

OTHER MATERIAL EXAMINED. **India**, Maharashtra State, Bhimashankar, 19°4'N, 73°32'E, 1–2.II.1990, 2♀, leg. V. & B. Roth, CASC; Maharashtra State, Dhasai env., II.1998, 2♀ leg. P. Rojek, FKCP; Rajasthan State, Mt. Abu, II.1998, 1♂, leg. P. Rojek, FKCP.

DISTRIBUTION. India (Madhya Pradesh) (Pocock, 1897b: 114) (Maharashtra) (first record) (Rajasthan) (first record).

COMMENTS. Pocock (1897b: 114) does not mention the sex of the type and gives the type locality as “Bhopal, Central India (Surgn.-Lieut.-Col. Dane)”. Tikader & Bastawade (1983: 266) say the type is a female No. 1893.12.20.4. Fet & Lowe (2000: 153) give the type locality as “Bhopal, now Madhya Pradesh, India” and list the holotype as a male No. 1893.12.20.4. I examined the type and found it to be a female with two labels: (1) “1893.12.20.4., *Isometrus rigidulus* Poc., TYPE, Burma, H. M. Phipson”, and (2) “*Isometrus (Reddyanus) rigidulus* Pocock 1897 Spécimen examiné en 1972 par Max Vachon”. There can be no doubt that it is the holotype, but the difference in label and original description makes its locality doubtful.

Examination of an adult male reveals the sexual dimorphism of this species to be less obvious than in other species of the subgenus *Reddyanus*. The manus of pedipalps is of the same width in both sexes. The male has slightly narrower and longer metasomal segments, and the terminal tubercle of each dorsal carina is more enlarged on the third than on the second metasomal segment. In the female the terminal tubercle enlargement

is to a lesser degree apparent on the third segment and is absent on the second segment.

***Isometrus (Reddyanus) vittatus* Pocock, 1900**

Isometrus vittatus Pocock, 1900: 50.

Isometrus (Reddyanus) vittatus: Vachon, 1972: 177; Vachon, 1976: 39 (in part); Kovařík, 1994: 202 (in part); Kovařík, 1995: 188 (in part); Kovařík, 1997a: 9 (in part); Kovařík, 1998b: 112 (in part); Fet & Lowe, 2000: 153 (in part).

Isometrus (Reddyanus) vittatus: Tikader & Bastawade, 1983: 257.

TYPE LOCALITY AND TYPE REPOSITORY. Madras, India; BMNH.

TYPE MATERIAL EXAMINED. **India**, Madras, 1♀ (holotype), leg. J. R. Henderson, BMNH.

DISTRIBUTION. India (Maharashtra, Tamil Nadu) (Pocock, 1900: 51; Tikader & Bastawade, 1983: 257).

COMMENTS. This species was based on a unique female from India (see photo in Kovařík, in press). Fage (1933, 1936, 1944) assigned to it specimens from Indochina, which I believe to belong to the above described *I. petzelkai* sp. n.

***Isometrus (Reddyanus) zideki* Kovařík, 1994**

Isometrus (Reddyanus) zideki Kovařík, 1994: 195; Kovařík, 1997a: 9; Kovařík, 1998a: 36; Kovařík, 1998b: 112; Fet & Lowe, 2000: 153.

TYPE LOCALITY AND TYPE REPOSITORY. Malaysia, Cameron Highlands; FKCP.

TYPE MATERIAL EXAMINED. **Malaysia**, Cameron Highlands, 1♂1♀ (holotype and paratype No. 2), FKCP, 1992, 1♂6♀ (paratypes Nos 1, 4, 6–10), FKCP, 1♀ (paratype No. 3), NMPC, 1♀ (paratype No. 3), BMNH, 1♀ (paratype No. 5), HNHM, 1994. **Indonesia**, Kalimantan, Nanga Pinoh, Tontag, 1♀ (paratype No. 11), 26.VII.1993, leg. J. Schneider, FKCP.

OTHER MATERIAL EXAMINED. **Malaysia**, Fraser's Hill, 4200 ft., 17.VI.1962, 1♀, leg. E. S. Ross & D. Q. Cavagnaro, CASC; Cameron Highlands, 1♂, 1992, FKCP; Terengganu State, Kg. Bintang env., 21–22.II.1988, 1♀, leg. S. Bečvář, FKCP; Templer park, ca 50 km near Kuala Lumpur, IV.2002, 1♀, leg. Šejna, FKCP.

DISTRIBUTION. Malaysia (Malay Peninsula) (Kovařík, 1994: 195), Indonesia (Kalimantan) (Kovařík, 1994: 195).

Key to the species of genus *Isometrus*

1. Trichobothrium *db* on chela of pedipalp situated between trichobothria *et* and *est*. subgenus *Reddyanus* 2
 - Trichobothrium *db* on chela of pedipalp situated between trichobothria *dt* and *et*. ... subgenus *Isometrus* 22
2. Subaculear tooth spinoid, without granules ... ***I. garyi*** Lourenço & Huber, 2002
 - Subaculear tooth stronger, apically sharp or blunt, always with 2–7 granules 3
3. Subaculear tooth with two symmetrical granules on the dorsal surface (and with or without granules on the tip) (see Figs. 1 and 5 to 7 in Kovařík, 1997a: 6) 4
 - Subaculear tooth with four or six symmetrical granules on the dorsal surface (and with or without granules on the tip) (see Figs. 8 to 10 in Kovařík, 1997a: 6) ... 13
4. Fifth metasomal segment wide and high, at mid-length slightly expanded laterally ***I. rigidulus*** Pocock, 1897
 - Fifth metasomal segments low and narrow, with lateral margins unexpanded and parallel .. 5
5. Metasoma of female more than twice the length of carapace and mesosoma ***I. corbeti*** Tikader & Bastawade, 1983
 - Metasoma of female less than twice the length of carapace and mesosoma 6
6. Fifth metasomal segment dark, brown to black (only at anterior margin may be lighter-colored) 7
 - Fifth metasomal segments light-colored, yellowish brown ***I. vittatus*** Pocock, 1900
7. Femur and patella of pedipalp yellow, without spots ***I. bilyi* sp. n.**
 - Femur and patella of pedipalp spotted. 8
8. Femur and patella of pedipalp spotted. Base coloration yellow with minute black spots, identical on femur and patella 9
 - Femur and patella of pedipalp spotted, patella primarily black, femur primarily yellow 11
9. Terminal tubercle of each dorsal carina on first metasomal segment of male markedly enlarged ***I. heimi*** Vachon, 1976
 - Terminal tubercle of each dorsal carina on first metasomal segment of male scarcely larger than preceding granules 10

10. Manus of pedipalp chela equally narrow in both sexes. *I. assamensis* Oates, 1888
– Manus of pedipalp chela wider in male than in female. *I. zideki* Kovařík, 1994
11. Terminal tubercle of each dorsal carina on second metasomal segment of both sexes markedly enlarged *I. melanodactylus* (L. Koch, 1867)
– Terminal tubercle of each dorsal carina on second metasomal segment of both sexes scarcely larger than preceding granules 12
12. Subaculear tooth apically sharp ... *I. kurkai* Kovařík, 1997
– Subaculear tooth apically rounded *I. khammamensis* sp. n.
13. Legs uniformly yellow *I. krasenskyi* Kovařík, 1998
– Legs spotted 14
14. Patella of pedipalp with one large black spot covering 70% of surface, no other spots *I. melanodactylus* (L. Koch, 1867)
– Patella of pedipalp without a large black spot, patella and femur may be yellow or spotted 15
15. Subaculear tooth wide and rounded 18
– Subaculear tooth more or less pointed, termination not rounded..... 16
16. Pectinal teeth number 12–14 (Philippines) *I. navaiae* Kovařík, 1998
– Pectinal teeth number 16–17 (India and Sri Lanka) 17
17. Terminal tubercle of dorsal carina on third metasomal segment of male markedly enlarged *I. acanthurus* Pocock, 1899
– Terminal tubercle of dorsal carina on third metasomal segment of male scarcely larger than preceding granules *I. loebli* Vachon, 1982
18. Pectinal teeth number 10–15 19
– Pectinal teeth number 17–18 *I. besucheti* Vachon, 1982
19. Total length of adult less than 30 mm (female)..... *I. problematicus* sp. n.
– Total length of adult always greater than 35 mm 20
20. Base coloration reddish with brown or black spots. Only in Sri Lanka *I. basilicus* Karsch, 1879
– Base coloration yellow with brown or black spots. Absent in Sri Lanka 21
21. Fourth metasomal segment of male ventrally without carinae. First two metasomal segments yellowish brown to black, third to fifth segments of adults black. *I. brachycentrus* Pocock, 1899
– Fourth metasomal segment of male ventrally with two carinae. Only fifth metasomal segment black (partially), first to fourth segments yellow to yellowish brown, in female with few minute black spots *I. petrzekai* sp. n.
22. Subaculear tooth spinoid 23
– Subaculear tooth wide and rounded *I. formosus* Pocock, 1894
23. First (basal) middle lamella of female pecten rounded (see Fig. 39 in Vachon, 1982: 88) ... *I. thwaitesi* Pocock, 1897
– First (basal) middle lamella of female pecten quadrangular (see Fig. 38 in Vachon, 1982: 88) 24
24. Manus of pedipalp very thin, width of male manus equals width of patella and femur. Pattern on mesosomal segments light-colored. Females usually reach ca. 45 mm. *I. maculatus* (DeGeer, 1778)
– Manus of pedipalp wide, width of male manus always exceeds width of patella and femur. Pattern on mesosomal segments often dark-colored. Females may reach nearly 60 mm..... *I. thurstoni* Pocock, 1893

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