

ON THE TAXONOMIC STATUS OF *TRAPEZIA TIGRINA*  
EYDOUX & SOULEYET, 1842 (DECAPODA, BRACHYURA)

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INTRODUCTION

*Trapezia tigrina*, first described by Eydoux & Souleyet, 1842, from Hawaii, has since been reported, mistakenly, as a synonym of a number of allied species. This misidentification stemmed from an original description lacking in some critical taxonomic features and misplacement of the type. Thus, re-description was deemed necessary to permit accurate identification of this taxon in future studies. The various synonymies are discussed.

***Trapezia tigrina* Eydoux & Souleyet, 1842 (fig. 1)**

*Cancer rufopunctatus* - Rüppell, 1830: 27, 28 (mentioned under *T. coerulea*).

*Trapezia tigrina* Eydoux & Souleyet, 1842: 232, pl. 2 fig. 4; Ward, 1939: 13, figs. 15, 16.

*Trapezia maculata* - Dana, 1852: 256; 1855: pl. 15 fig. 4; Streets, 1877: 103; De Man, 1888: 319, pl. 13 figs. 2, 2a; Henderson, 1893: 366; Alcock, 1898: 221 (p.p.); Nobili, 1906: 293; Stimpson, 1907: 73; Balss, 1924: 13; Ramadan, 1936: 35; Monod, 1938: 142; Edmondson, 1946: 301, fig. 180f.

*Trapezia rufopunctata* - Jacquinet & Lucas, 1853: 41 (p.p.); Heller, 1861a: 13; Heller, 1861b: 350; Hilgendorf, 1869: 75, pl. 2 fig. 3b (p.p.); A. Milne-Edwards, 1873: 258 (p.p.); Kossmann, 1877: 42 (p.p.); De Man, 1880: 176; De Man, 1881: 94; Miers, 1884: 536 (p.p.); Klunzinger, 1913: 309, pl. 7 fig. 13.

*Trapezia ferruginea* var. *rufopunctata* - Paulson, 1875: 48, pl. 7 figs. 3-3a.

*Trapezia ferruginea maculata* - Ortmann, 1897: 206 (p.p.); Lenz, 1912: 4.

*Trapezia ferruginea* var. *maculata* - Borradaile, 1900: 590; Borradaile, 1902: 265.

*Grapsillus maculatus* - Rathbun, 1906: 865.

*Trapezia cymodoce maculata* - Rathbun, 1911: 235; Rathbun, 1930: 558, pl. 228 figs. 3, 4; Edmondson, 1962: 300, fig. 31b.

*Trapezia cymodoce* var. *maculata* - Laurie, 1915: 462.

*Trapezia danae* Ward, 1939: 13, figs. 17, 18.

*Trapezia danai* - Knudsen, 1967: 51; Garth, 1974: 402.

*Trapezia* aff. *danai* - Serène, 1969: 136, figs. 14a, 17, 20 (p.p.); Garth, 1971: 198.

*Trapezia wardi* Serène, 1969: 140; Serène, 1971: 914; Preston, 1973: 470; Edwards & Emberton, 1980: 235; Coles, 1980: 283.

*Trapezia* aff. *wardi* - Garth, 1971: 198.

*Trapezia flavopunctata* - Chen & Lan, 1978: 281, fig. 12.

? *Trapezia rufopunctata* - Cano, 1889: 211; Wedenissow, 1894: 413; Edmondson, 1923: 20.

? *Trapezia rufopunctata* var. *maculata* - Ortmann, 1893: 484; Guinot, 1962: 240.

? *Trapezia ferruginea maculata* - Lenz, 1901: 466; Lenz, 1910: 552.

? *Trapezia maculata* - Nobili 1901: 16; Nobili, 1905: 10; Lenz, 1905: 351; Laurie, 1906: 410; Stebbing, 1910: 304; Gravier, 1920: 470; Pesta, 1928: 72.

- ?*Trapezia cymodoce maculata* - Rathbun, 1907: 52 (p.p.).  
 ?*Trapezia ferruginea* forme *maculata* - Bouvier, 1915: 272.  
 ?*Trapezia ferruginea* subsp. *maculata* - Michel, 1965: 30.  
 not *Trapezia acutifrons* - A. Milne Edwards, 1867: 281.  
 not *Trapezia rufopunctata* - A. Milne Edwards, 1873: 258.  
 not *Trapezia tigrina* - Serène, 1969: 133.

## Material examined

## Red Sea:

- Elath, Gulf of Elath (= Aqaba), 10 October 1952; 1♂, cl. 10.2 mm; identified as *T. wardi*, "Type" by Serène (TAU NS 62); 10 October 1952; 1♂, 1♀ cl. 10.1, 11.6 mm; identified as *T. wardi*, "Cotype" by Serène (TAU); 21 May 1958; 1♂, cl. 13.4 mm (Senck. M. 4102).  
 Nabeq, Gulf of Elath, Sinai; 17 October, 1979; 1♂, cl. 7.1 mm (TAU).  
 Gulf of Elath, Sinai; 24 June 1976; 2 m., on *Stylophora*; 1♂ 1♀, cl. 10.8, 10.8 mm (TAU); 1980; on live corals; 5♂♂ 9♀♀, cl. 10.9, 9.0, 7.5, 6.9, 6.7, 12.4, 10.7, 10.6, 10.5, 10.2, 10.0, 10.0, 9.8, 9.2 mm (TAU).  
 Senafir Id., entrance to Gulf of Elath, 8 January 1949; coll. "Manihine"; 1♂ 3♀♀ 1 juv., cl. 12.2, 15.4, 13.4, 14.1, 9.2 mm (BM).  
 Na'ama, N. of Sharm el Sheikh, Sinai; 15 October 1979; 1♂, cl. 12.2 mm (TAU); 6 November 1981; 1 m deep from living coral, 1♂ 1♀, cl. 10.5, 11.3 mm (TAU).  
 Sharm Moiya, N. of Sharm el Sheikh, Sinai; 3 February 1949; fauna assoc. with coral; coll. "Manihine"; 1♂ 1♀, cl. 11.3, 12.4 mm (BM 1959: 1:17:56-63).  
 Et Tur (= Tor), Gulf of Suez, Sinai; January-July 1826; leg. F. Rüppell; 1♂ 1♀, cl. 12.3, 12.1 mm (Senck. M. 4038).  
 Daedalus Shoal, 1874; coll. Lt. Col. Playfair; 2♂♂ 2♀♀ 2 juv., cl. 12.8, 12.2, 14.1, 11.3, 7.6, 7.5 mm (BM 1874: 89).  
 Shab Baraja, Sudan; 19 October 1977; on reef corals; 1♀, cl. 14.8 mm (Senck. M.).  
 Assab, Ethiopia, Red Sea; 15 February 1966; half dead coral, 50 cm; 2♂♂ 2♀♀, cl. 12.2, 12.1, 13.8, 13.5 mm (RMNH).  
 Red Sea; leg. R. Kossman; 5♂♂ 9♀♀, cl. 11.6, 10.9, 10.8, 10.6, 9.9, 13.5, 13.3, 13.0, 12.7, 12.3, 12.0, 11.7, 11.3, 11.2 mm (Senck. M. 9548).

## Indian Ocean:

- Sapper Bay, Aden; October 1966; coll. K. England; 1♂, cl. 9.6 mm (BM 1974: 99).  
 Aden: 1885; 1♂ 4 juv., cl. 13.3, 6.6, 6.1, 5.2, 4.9 mm (BM 1885: 14).  
 Gesira, 20 km S. of Mogadiscio, Somalia; August 1976; leg. M. Vannini; 1♂ 1♀, cl. 10.9, 11.9 mm (MF); October 1979; leg. M. Vannini; 1♂ 1♀, cl. 8.2, 11.6 mm (MF); 1♂ 1♀, cl. 12.1, 11.4 mm (MF); 1♀ 1 juv. cl. 7.3, 4.3 mm (MF); 1♀ cl. 7.6 mm (MF); 4 juv., cl. 7.0, 6.7, 3.7, 2.9 mm (MF); 5 juv., cl. 6.8, 6.1, 3.7, 3.5, 2.9 mm (MF).  
 Etoile Island, Amirante Isl.; April 1882; 13 fins. coral; H.M.S. "Alert"; 2♂♂ 1♀, cl. 11.7, 10.9, 12.2 mm (BM 1882: 24).  
 Imma Is., Malé Atoll, Maldives; 21 March 1964; ex *Pocillopora*; 1♀ 1 juv., cl. 7.9, 5.2 mm; (identified as aff. *wardi* Serène) (AH).  
 Dunidu Is., Malé Atoll, Maldives; 19 April 1964; ex *Pocillopora woodjonesi*; 1♂ 1♀, cl. 15, 18 mm (AH).

## Pacific Ocean:

- Phillipines; 15 January 1908; U.S.F.C. Str. "Albatross"; 1♂ 1 juv., cl. 11.2, 5.4 mm (USNM).  
 Ifaluk Atoll, Caroline Isl.; 1953; 1♂, cl. 10 mm (USNM 200652).  
 Kapingamarangi Atoll, Caroline Isl.; 12 August 1954; 1♀, cl. 12 mm (USNM 230088).  
 Eniwetok Atoll, Marshall Isl.; 18 August 1966; coll. J. W. Knudsen; 1♂ 1♀, cl. 11.7, 13.4 mm; identified as *T. aff. danai* Serène, 1969 (AH).  
 Rigili Is., Eniwetok Atoll, Marshall Isl.; 2 August 1966; coll. J. W. Knudsen; 1♂, cl. 7.4 mm (AH).  
 Japtan Is., Eniwetok Atoll, Marshall Isl.; 4 August 1966; coll. J. W. Knudsen; 2♀♀, cl. 5.7, 4.4 mm (AH).

- Honolulu, Hawaii; 1834; 18 fms; H.M.S. "Challenger". 1 ♀, cl. 15.7 mm (BM 1834: 31).  
Waikiki, Oahu, Hawaii; 1923; 1 ♀, cl. 16.6 mm (BPBM S 1568).  
Kauai, Hawaii; 1902; U.S.F.C. Sta. "Albatross"; 1 ♂ 1 ♀ 1 juv., cl. 13.5, 15.8, 6.1 mm (USNM 29486).  
Pt. Allen, Kauai, Hawaii; 12 October 1959; 8 ♂♂ 2 ♀♀, cl. 14.8, 14.9, 12.5, 13.1, 12.1, 12.0, 9.2, 7.8, 10.8 mm (BPBM S 6610).  
Anaa Atoll, Tuamotu Arch.; 27 October 1967; 60-70 ft.; National Geographic Soc.; 1 ♂, cl. 11 mm (USNM 291828).  
Tikehae Lagoon, Tuamotu Arch.; 11 April 1957; 1 ♂ 1 ♀, cl. 9.0, 9.0 mm (USNM 213821).  
Society Isl.; coll. A. Garrett, id. W. Faxon; 1 ♂ 2 ♀♀, cl. 10.9, 11.4, 7.7 mm (USNM 158983).  
South coast of Pitcairn Is., S. Pacific; 20 October 1967; 22 fms. coral; National Geographic Marquesas Expedition; 1 ♂ 1 ♀, cl. 12.8, 14.8 mm (USNM 291828); 20 September 1967; 22-25 fms.; coral; National Geographic Marquesas Expedition; 1 ♂, cl. 7.8 mm (USNM 291828), largest male, cl. 15 mm; female, cl. 18 mm; smallest juvenile, cl. 2.9 mm.

The material is deposited in the Allen Hancock Museum in the University of Southern California (AH); the British Museum (Natural History) (BM); Bernice P. Bishop Museum, Honolulu (BPBM); Rijksmuseum van Natuurlijke Historie, Leiden (RMNH); Museo Zoologico of the University of Florence (MF); Senckenberg Museum (Senck. M.); the Zoological Museum of Tel Aviv University (TAU) and the U.S. National Museum (USNM).

The abbreviation cl. stands for carapace length.

Morphological description. — Carapace smooth, slightly convex, without definite regions. Antero-lateral margins slightly curved inwards in the direction of outer orbital spine, but inflated in the middle so that the margins are parallel along the proximal half. In younger specimens (cl. < 8 mm) the carapace is quite as broad at the outer angles of the orbits as between the lateral teeth or even slightly divergent, but in larger specimens, especially gravid females, it is slightly contracted in front. Posterolateral margins convergent backwards from a distinct lateral epibranchial tooth which in juveniles always projects as a sharp spine, some adults retain that character. Front, four-lobed, projects beyond the orbits, over the antennules and bases of the antennae which are excluded from the orbits. The frontal submedian pair of lobes are triangular, separated from each other by a shallow V-shaped incision and from the outer pair of lobes by a wider, uneven sinus; both lobes of this outer pair are about twice as wide basally as each submedian lobe, and directed obliquely outwards, their edge sometimes finely denticulate. Apices of outer pair of frontal lobes not extending as far forward as the submedians. The internal angles of the orbits are rounded and less prominent than the front. The orbits, too shallow to conceal the eyes, are cut out of the antero-lateral angles of the carapace. The inferior inner orbital tooth is conical, incurved and rather prominent. The postorbital tooth is acute, often incurved. The antennae have the peduncular articles small, fitted in between the outer side of the slender antennular groove and the inner side of the inferior orbital angle. The third maxillipeds are subrectangular, with the exognath not quite extending to the distal angle of the endognath. The ischium of the endognath with the inner margin

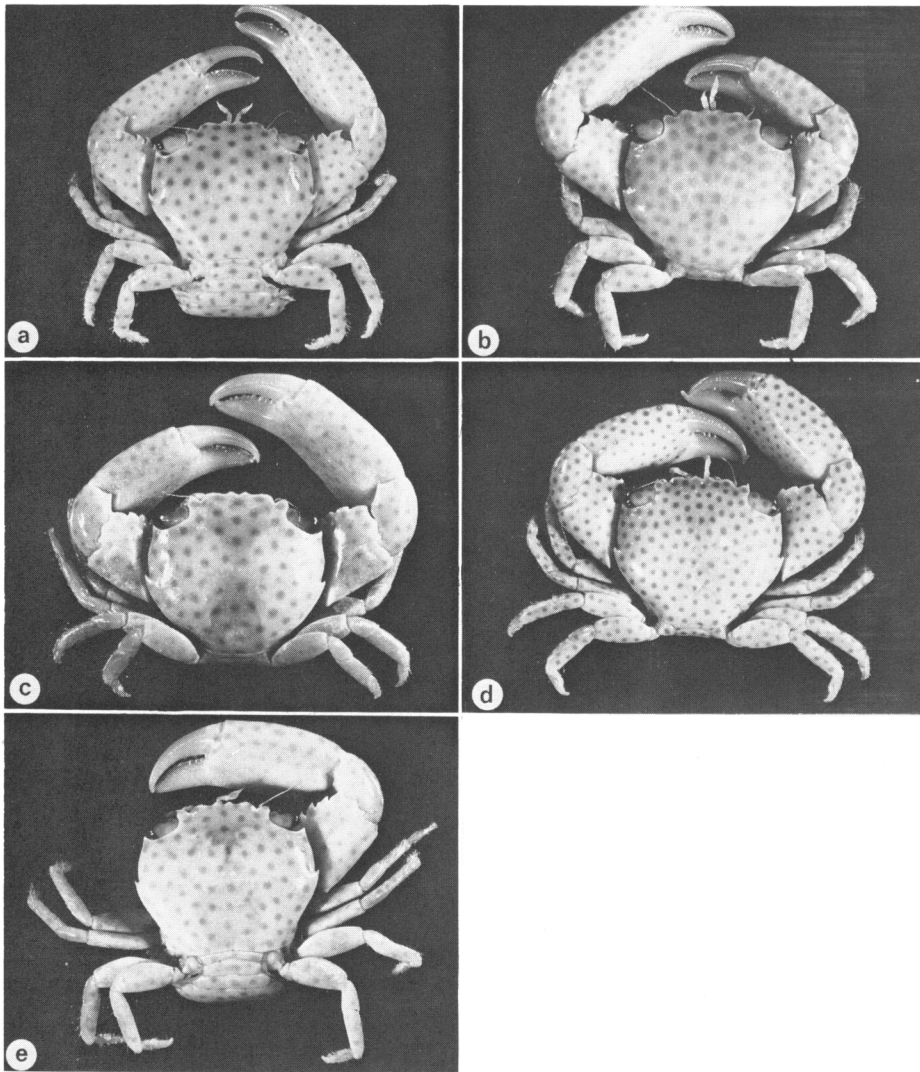


Fig. 1, *Trapezia tigrina* Eydoux & Souleyet. A, female (cl. 11.3 mm) from Na'ama, Sinai, Red Sea; B, male (cl. 12.2 mm) from Assab, Ethiopia, Red Sea; C, male (cl. 11.5 mm) from Aden, south coast of Arabian Peninsula; D, male (cl. 12.1 mm) from 20 km S of Mogadiscio, Somalia; E, female (cl. 12.5 mm) from Kauai, Hawaii.

rounded. Inner lip of merus rounded, inner distal angle truncate and outer distal margin rounded. Chelipeds smooth, glabrous and considerably developed. Chelipeds subequal in females and young males, noticeably unequal in adult males. The meri project beyond the lateral margins of the carapace; the distal margin is provided with one triangular tooth. Anterior margins armed with 5-7 small teeth, simple or serrulate, which increase in size

distally. The shape and number of the meral teeth is subject to variation, often the right and left arms of a specimen are strongly unequal. Minute teeth, observed only under magnification, decorate the lower margin of the palm. Inner angle of carpus produced, covered with squamiform granules. A tooth-like pointed prominence decorates the antero-internal angle of the carpus. Fingers incurved, distally acute. Ambulatory legs slender, with segments slightly compressed. Dactyli sparsely pubescent and rather shorter than propodi. The distal end of the dactyl is curved and composed, on the upper surface, of several rounded ridges, blunted distally, thus giving the tip an appearance of a denticled rasp. Posterior margin in ambulatory dactyli with five parallel transverse rows of short, blunt spines and a cluster of stout setae at distal end. The shape and number of rows is of importance systematically.

Color in alcohol. — Conspicuous round, reddish spots on a creamy yellow or rosy background cover carapace, abdomen and pereopods. The configuration of the spots varies among juveniles and adults.

Remarks. — The type of *Trapezia tigrina* Eydoux & Souleyet, 1842, is deposited in the Muséum National d'Histoire Naturelle in Paris. Despite a passage of 140 years, the dry specimen is in good state of preservation, even though all traces of color have disappeared. Its box, No. 2950, contained the legend: "*T. flavomaculata* Eydoux & Souleyet. Trapezie taches jaunes, type unique" and inside a handwritten note by J. Forest, 1960, "je doute que ce soit le type de *T. flavopunctata* car il ne correspond pas aux dimensions du type." Another box, No. 2968, which contains a specimen of *T. flavopunctata* bore the legend: "*T. tigrina* type", and a note by D. Guinot: "il y a une erreur dans les types de *Trapezia flavopunctata* et *T. tigrina*. Le type No. 2968 de *tigrina* est en fait celui de *flavi punctata* de la fig. Pl. 2 fig. 3 d'Eydoux et Souleyet espèce bien conservée outre sa couleur par la bord inférieur de la paume du chelipède avec 'des tubercules' dit Eydoux et Souleyet, fortement denticulé comme la figure et le type 2968. Le type No. 2950 de *flavomaculata* (erreur pour *flavopunctata*) est en fait celui de *tigrina* de la Pl. 2 fig. 4, espèce conservée outre sa couleur par le bord inférieur de la paume des chelipeds en "crete (lisse) trachante". And indeed, checking measurements given by Eydoux & Souleyet and their excellent figures, I have no doubt that the contents of those boxes were exchanged either by the original authors or not long afterwards: A. Milne Edwards (1867), while describing *T. acutifrons*, writes: "Cette espèce se rapproche beaucoup par sa taille de la *Trapezia tigrina* Eydoux & Souleyet". *T. acutifrons* A. Milne Edwards is accepted as a synonym to *T. rufopunctata* which indeed bears a close resemblance to *T. flavopunctata* that probably by then occupied the box of *T. tigrina*. Serène (1969) too, clearly erred when he described *T. tigrina* as having "the frontal lobes well marked but comparatively less salient and less acute than *rufopunctata* and *acutifrons*; the lower margin of palm of cheliped strongly granular". Figure 4 in his manuscript given as "*tigrina* (Type, Paris Museum)" is obviously that of *flavopunctata*.

The unfortunate exchange together with a typographical error in Eydoux & Souleyet (1842) which placed the figure of *T. tigrina* at number 2 instead of 4 were probably the source of ambiguity concerning this species.

Dana (1852) was first to include *T. tigrina*<sup>1)</sup> into synonymy with *T. maculata* (Macleay), not his fault really, as Macleay's description (1838) consisted of just three lines. Thus, many subsequent authors followed Dana in the use of the name *maculata*: Streets (1877), Ortmann (1897), Alcock (1898) and Lenz (1901), wrote of *T. maculata* (Macleay) Dana. Unfortunately, Macleay's type is lost now. Mrs. Helen Tranter of the Australian Museum, Sydney wrote us: "The position is that the Macleay Museum no longer appears to have the type of this species and there is no record of there ever being any paratypes, ... The locality of the type must now be regarded as unknown". However, it seems that *T. maculata* (Macleay) is close to *T. rufopunctata*. Ward (1939) examined Macleay's type and then went on to establish a new species *T. danae* for *T. maculata* as described by Dana, 1852, (not *T. maculata* (Macleay, 1838)). His description lacks in details, but photographs were taken.

Barnard (1950: 278) writes "from the photograph of Macleay's specimen sent me by Mr. Ward, it appears that Krauss' surmise that this was *rufopunctatus* was correct. The photograph shows traces of large spots on the cheliped, which has a serrulate lower border". Alas, this photograph too was lost. D. Griffin & P. Stabury (1970) examined the type and identified it as *T. rufopunctata*. J. S. Garth (1974), who checked this type too, agrees with this identification.

Ward (1939) established *T. danae* n. sp. for *T. maculata* as described by Dana. *T. danae* was separated from *T. maculata* (Macleay) by an elongated carapace, less developed frontal teeth and smaller spots on carapace and chela. Though Ward overlooked the character of the lower border of the palm which is serrulate in *T. maculata* Macleay, it is evident from the included photographs (figs. 17, 18) that in this specimen the palm is entire. The American Museum of Natural History possesses Ward's (1939) specimens of *T. tigrina* and *T. danae* type specimens from Samoa and kindly let the senior author (B.G.) examine them. *T. danae* Ward corresponds in all morphological aspects to *T. tigrina* Eydoux & Souleyet. Ward placed his specimens of *T. tigrina* near *T. rufopunctata* (Herbst) and then listed differences concerning the shape of frontal teeth, lack of serrulation on manus and proportion of carapace which clearly described his specimens as true *T. tigrina* Eydoux & Souleyet. Ward's figs. 15 and 16 are of a typical juvenile *T. tigrina*.

Serène (1969) described *T. aff. danai* from material in Allan Hancock Museum collected by J. Garth. He based his identification on the denticulation of the anterior border of the merus, a notoriously unstable character in

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<sup>1)</sup> Dana's specimens are not extant but his description and drawings are lucid and we confidently assign them to *T. tigrina*.

*Trapezia*. As comparative material, Serène chose specimens from Mauritius (his figs. 14a, 21) which are decorated with more than 120 spots on the carapace, while the type of *T. danae* Ward has 50 spots. Upon close examination by us the specimens from Mauritius were assigned to *T. richtersi*, a new species described by us not long ago. Thus, we can reject Serène's observations on the number of spots decorating the carapace of *T. danae*.

Serène (1970) on Vietnamese material established *T. wardi* n. sp. for *T. tigrina* as described by Ward. He separated it from *T. danae* by its having a wider carapace, an acute external orbital angle and epibranchial teeth, the merus of the cheliped is armed with 6 or 7 sharp teeth terminating in outcurved spines - all features actually characterizing young specimens of *T. tigrina*. Serène wrote that *T. tigrina*, as described by Ward, is different morphologically from the type of *T. tigrina* Eydoux & Souleyet (1842) which he had examined in the Paris Museum, but as mentioned above, he was misled by the interchange of Eydoux & Souleyet's types.

In the Allan Hancock Museum of the University of Southern California, we found the specimens described by Serène (1969) as *T. wardi*. We checked too, material from Elath (Gulf of Aqaba, Red Sea) identified by Serène as *T. wardi* "type" and "cotype" but not published as such; these specimens are illustrated in figs. 17-19 in Serène's (1969) paper. Serène (1969) saw mostly very small specimens, none exceeding 8 mm, in his own words: "The specimens of the present collection are too small, mainly the male, to be identified with some certitude but they are closer to *wardi* than to *danae*". In our opinion, Serène mistook the juvenile features of *T. tigrina* and thus established a new species.

After careful examination of the literature and a considerable amount of material from many parts of the Indo-West Pacific, we are of the opinion that the material and the synonymies mentioned here belong to a single valid species - *T. tigrina* Eydoux & Souleyet, 1842.

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#### ZUSAMMENFASSUNG

*Trapezia tigrina* Eydoux & Souleyet, 1842, wurde nach Material aus Hawaii beschrieben. Die Art geriet in Vergessenheit und späteres Material von ihr wurde mit anderen Arten der Gattung identifiziert, hauptsächlich mit *T. rufopunctata* (Herbst, 1799) und *T. maculata* (Macleay, 1838). Serène (1970) beschrieb die Art als neu unter dem Namen *T. wardi*. Zu den genannten Irrtümern führten hauptsächlich zwei Gründe: Die ungenügende Originalbeschreibung der Art und die Verlegung des Typusexemplares von *T. tigrina* in die Schachtel des Typusexemplares von *T. flavopunctata* Eydoux & Souleyet und umgekehrt.

Die Art wird hier neu beschrieben und die verschiedenen Synonyme diskutiert.

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