

## The origins of *Isometrus maculatus* and other scorpions on the smaller islands of the western Indian Ocean

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The circumtropical and almost cosmopolitan scorpion *Isometrus maculatus* (Geer, 1777) is generally regarded as a species introduced by man. Its origins are obscure but are assumed to be Oriental (Pocock 1909). It has a very wide distribution, being first recorded from Europe (Linnaeus 1758, as *Scorpio europaeus* prior to its description by Geer in 1777 as *S. maculatus*), then from South America in 1800, Africa (1858) and Asia (1892) (Pocock 1909). Indian Ocean records start from 1868 (Pike 1970a - see below).

In Seychelles *I. maculatus* has been recorded from Mahé (since 1905), Silhouette (1998), Aride (1979), Cousin (1974), Bird (1905) and Denis (1905) in the central islands and from Astove (1905), Cosmoledo (1905) and Aldabra (Takamaka, Ile Esprit and Ile Michel; 1905) in the corraline islands. In the Mascarenes it is known from Round island and Gunner's Quoin. It has been recorded in houses (Mahé, Aride, Cousin), under bark (Silhouette, Round island) or in caves (Silhouette) and is clearly well adapted to dispersal by rafting or as a stow-away in cargo.

Other scorpions on small Indian Ocean islands include the superficially similar *Lychas* (*Archisometrus*) spp. (distinguished by the presence of tibial spurs on legs III and IV) which usually reach 30-60mm rather than the 45-70mm of *I. maculatus*. These are endemic to the islands they inhabit (*L. braueri* (Kraepelin, 1896) on the Seychelles islands of Mahé, Silhouette and Praslin) and *L. serratus* (Pocock, 1890) on Round island, Mauritius. *L. braueri* is extremely rare; it was collected on Praslin in 1894 by A. Brauer (Kraepelin 1896) and on Mahé ("in high jungle") and Silhouette by the Percy Sladen Memorial Expedition in 1905 (Hirst 1913). The only subsequent record is a single specimen from Jardin Marron, Silhouette in 1990 (OUSE 1990). *L. serratus* appears to be extinct, not having been located since 1868. Also present is *Chiromachus ochropus* (Koch, 1838), belonging to a monospecific genus regarded as a Seychelles endemic but recorded from Zanzibar and Round island (Mauritius) (Pocock 1893). The Zanzibar record is supported by 6 specimens in the British Museum (Natural History) and the Round island record by a single specimen presented by H. Barkly. The Barkly material is reliable, being collected by Lt. Col. N. Pike (see below), but the provenance of the Zanzibar specimens is doubtful. There are three puzzling records from Zanzibar; the scorpion, the whip-scorpion *Phrynops scaber* and the Seychelles chameleon *Chamaeleo tigris*. The first two records are found on Seychelles and Round island so could plausibly have reached Zanzibar whilst the chameleon is a Seychelles endemic restricted to Mahé, Silhouette and Praslin islands. All the Zanzibar records are derived from specimens collected by Capt. J.E. Parish in the late 1800s. Thus the Zanzibar records of *Chamaeleo tigris*, *Chiromachus ochropus* and *P. scaber* are almost certainly errors for Seychelles specimens. *C. ochropus* appears to be extinct on Round island. In Seychelles it has been recorded

on Mahé, Praslin, Fregate and Recifs. The only Mahé record is from 1768 (Gerlach 1995), it is occasionally located in the Vallée de Mai on Praslin (P. Matyot *pers. comm.*) and is relatively abundant on Fregate. The status of the Recifs population is unknown.

The Round island (Mauritius) specimens provide some useful information in the collecting notes made by Lt. Col. N. Pike (1870a&b). During his visit in 1868 Pike (1870a) noted that "scorpions and centipedes were plentiful, especially on the palms. The former were quite green, and could scarcely be distinguished from the leaves; though they changed to brown on being put in alcohol. They were about 2 inches in length, of a species I have not seen in Mauritius." This appears to be the same as his collected specimen "No. 7" (Pike 1870b):

"No. 6. Two small scorpions found on the vacoa (*Pandanus Vandermeerschii*) and very plentiful on the broken leaves. They seem entirely different from the Mauritius scorpions, or from specimens I have seen from the adjacent Islands of the E. Indies."

"No. 7 is a very singular specimen I captured on my first visit to Round Island. It was of a bright green just the colour of the Palm (on which) I found it. The creature was very active and defiant, and it was with difficulty I caught him. You will observe the great length of the tail compared with the others; its sting was unfortunately broken off by accident. I think it is rare as I failed to find it on my second visit, and it was whilst diligently searching for one I found the large.

"No. 8. This formidable and ugly looking animal is not uncommon in the crevices of rocks and under the stones round the summit of the mountain. It is most pugnacious and when headed off from its retreat will show fight by raising the palpi, and clapping them together making a clicking noise like a crab.

"This Scorpion measures  $4\frac{3}{4}$  inches from head to tail, and the palpi  $3\frac{3}{4}$  inches making a total length of  $8\frac{1}{2}$  inches, the latter are  $1\frac{1}{4}$  in circumferences. The body and legs are brown and the palpi black. I tried but unsuccessfully to capture another that was running off very fast over the stones with what I took to be *Scincus Boutonii* in its claws." (Pike 1870b)

Pike's specimen "No. 7" is the damaged holotype of *L. serratus*, and the only known specimen of this species. "No. 6" is *I. maculatus* and No. 8. To *Chiromachus ochropus*. From these notes it is apparent that *I. maculatus* was abundant on Round island, both this and *L. serratus* were largely arboreal. In contrast the large *C. ochropus* was a terrestrial predator of small vertebrates and probably large invertebrates (Pike noted large beetles and phasmids as being present; Pike 1870a&b). The devastation of Round island by erosion, following overgrazing by rabbits and goats in the 1900s resulted in the loss of *L. serratus* and *C. ochropus*. In 1948 no scorpions were located (Vinson 1949) although *I. maculatus* is still present and has been recorded on several occasions (1975 - Bullock & North 1976, 1982 - Bullock *et al.* 1983, 1993 - P. Daszak *pers. comm.*). It was also recorded on Gunner's Quoin in 1982 (Bullock *et al.* 1983).

If introduced then presumably on the only cargo to be unloaded onto Round island prior to 1868 - rabbits or goats (the former at an unknown date before 1844 and the latter between by 1868; Cheke 1987) and its date of introduction could be assumed to be in the early 1800s, significantly earlier than the first Seychelles record.

There seems to be little doubt that the Round island *Lychas serratus* is extinct. Pike

(1870b) noted it as being conspicuous and the vegetation it was recorded on was largely destroyed in the late 1800s. The status of the Seychelles species is difficult to determine, it is clearly very rare but the reasons for its rarity and its true distribution remain obscure. The observation of a living specimen is the single recent specimen (Silhouette 1990) which was killed and eaten by ants (*Technomyrmex albipes*) (P. Matyot pers. comm.). Research into the ecology of this species is a high priority. It has previously been classified as endangered (Gerlach 1997).

*Chiromachus ochropus* also appears to be extinct on Round island, again, habitat destruction would seem to be the most likely cause. The species remains locally abundant in Seychelles, particularly on the island of Fregate. On Mahé it appears to be extinct, not having been encountered for 231 years. On Praslin occasional specimens have been encountered in the Vallée de Mai (one of these was kept in captivity and fed on cockroaches - P. Matyot pers. comm.). The status of the Recifs population is unknown. Fregate supported large numbers of the species although the large population of brown rats (*Rattus norvegicus*) which invaded the island in 1995 have been suggested to be a potential threat (Gerlach 1997). There are recent reports of apparent declines in abundance and scarcity of large adults (M. Nicoll & K. Murray pers. comm.) although quantified data are lacking. The species has previously been regarded as vulnerable (Gerlach 1997), recent suggested declines may indicate that it is now endangered (A2e and B1&2e in the IUCN Red List criteria). Research and conservation measures have been planned as a matter of urgency.

In conclusion, the Seychelles and Mascarene islands are known to be inhabited by two native scorpion genera, *Chiromachus* and *Lychas*, currently represented by highly endangered relictual populations in Seychelles only. *Isometrus maculatus* is probably introduced but this cannot be known with certainty. It may fill the ecological niche left by the extinction of *Lychas serratus* on Round island.

## References

- Bullock, D.J. & North, S.G. 1976 - *Edinburgh University expedition to Round Island, Mauritius, 1975. Final Report.* Unpubl.
- Bullock, D.J., North, S.G. & Greig, S. 1983 - *Round Island Expedition 1982.* Unpubl.
- Cheke, A. 1987 - pp. 5-89 in Diamond, A.W. (Ed.) *Studies of Mascarene Island Birds.* Cambridge University Press, Cambridge.
- Daszak, P. 1994 - *Report on the Raleigh International Expedition to Round island, 1993.* Unpublished.
- Gerlach, J. 1995 - *Phelsuma* 3; 67-71
- " - (Ed.) 1997 - *Seychelles Red Data Book 1997.* NPTS, Seychelles.
- Hirst, A.S. 1913 - *Trans. Linn. Soc. Lond. (Zool.)* 13; 31-37
- Kraepelin 1896 - *Mt. Mus. Hamburg* 12; 123
- Linnaeus, C. 1758 - *Systema naturae.*
- OUSE 1990 - *Oxford University Silhouette Expedition 1990.* Unpublished.

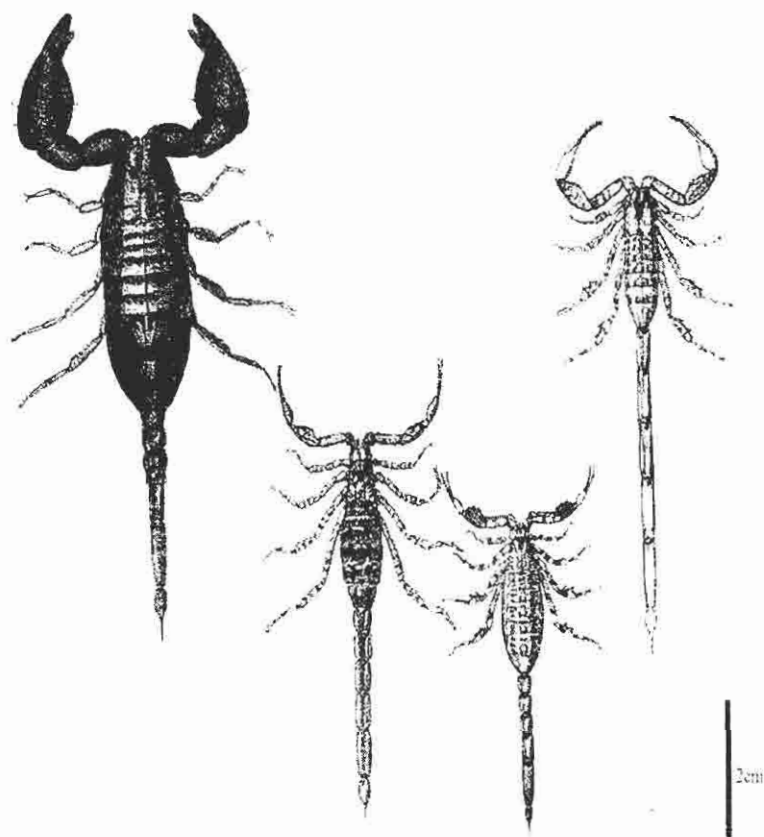
Pike, N. 1970a - *Trans. R. Soc. Arts Sci. Maur.* NS. 4; 11-22

- " - 1870b - *Trans. R. Soc. Arts Sci. Maur.* NS. 4; 131-135

Pocock 1893 - *Ann. Mag. Nat. Hist.* (6) 12; 320

- " - 1909 - *Arachnida*. In: *Fauna of British India*. Taylor & Francis, London.

Vinson, J. 1949 - *Proc. R. Soc. Arts Sci. Maur.* 1; 32-52



*Chiromachus ochropus*

*Isometrus maculatus*

*Lychas braueri*

*Lychas serratus*