



<http://dx.doi.org/10.11646/zootaxa.3914.4.9>

<http://zoobank.org/urn:lsid:zoobank.org:pub:8744E558-5BF8-43CB-8703-7EC047A23970>

On some recent taxonomic advancement and the resultant problems in the arboreal skink genus *Dasia* Gray, 1839 (Reptilia: Scincidae)

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South Asian members of the arboreal skink genus *Dasia* Gray, 1839 were recently reviewed using morphological and molecular approaches (Wickramasinghe *et al.* 2011; Harikrishnan *et al.* 2012). Harikrishnan *et al.* (2012) described a new species, *Dasia johnsinghi*, from South India. Both reviews add considerably to our taxonomic knowledge of the genus, but are unfortunately marred by several inaccuracies and lapses in taxonomic and nomenclatural practice. Taxonomic research is socially relevant because it contributes to the understanding of biodiversity (Bhat & Sarma, 2014) and it is responsible for laying the foundation for conservation (Dubois 2003; Evenhaus 2007); consequently, we believe taxonomists must take responsibility for maintaining publication quality, to promote conservation and science, and in this case, herpetology. While pernicious descriptions are harmful to the growth of herpetology in the region [i.e. the Western Ghats] (Vasudevan *et al.* 2007) in a time expecting quality science (Shanker, 2014) inaccuracies and errors in taxonomic literature should be carefully guarded against.

In this article, we list and correct the errors that appeared in Wickramasinghe *et al.* (2011) and Harikrishnan *et al.* (2012). We address and correct major errors from those papers including usage of names in which the species epithet does not match the gender of the genus, mis-designating type specimens, not attributing the correct authors to the species (and correct year to the genus), and the inconsistency of attributing importance to certain morphological characters and criteria for delimiting species boundaries within the genus *Dasia*. Our references to “Art.” refer to Articles in the *International Code of Zoological Nomenclature*, fourth edition (ICZN, 1999).

(1) The first issue that we came across with these publications was the species epithet does not match the gender of the genus. Wickramasinghe *et al.* (2011) and Harikrishnan *et al.* (2012) have repeatedly used the names *Dasia halianus* and *Dasia subcaeruleum* respectively in their publications, which are, in fact, incorrect combinations. Generic names are deemed to be words in ancient Greek or Latin (Art.26), and consequently have gender. Art.30.1.1 states: “a genus-group name that is or ends in a Latin word takes the gender given for that word in standard Latin dictionaries”, and Art.30.2.4 goes on to specify, “If no gender was specified or indicated [by the describer], the name is to be treated as masculine, except that, if the name ends in *-a* the gender is feminine, and if it ends in *-um*, *-on*, or *-u* the gender is neuter”. A species-group name must agree in gender with the generic name, “if it is or ends in a Latin or Latinized adjective or participle in the nominative singular” (Art.31.2).

When describing his new species of Sri Lankan skink, Nevill (1887) used the combination *Euprepes halianus*, which was grammatically correct as the generic name ends with *-pes*, the Latin for “foot”, which is masculine in gender. Wickramasinghe *et al.* (2011) used the combination *Dasia halianus*, with a feminine generic epithet (*Dasia*) but a masculine specific epithet (*halianus*) which, according to the code, should have been feminine in gender (i.e. *haliana*). Thus, it is clear that the specific ending used is incorrect. Smith (1935) was apparently the first to reassign Nevill’s species to *Dasia* Gray, 1839, and he correctly revised the specific name to *haliana*. Later, Boulenger described an Indian species as *Lygosoma subcaeruleum*, which was, likewise, grammatically correct as the generic name ends with *-soma*, the Greek word for “body”, which is neuter in gender, and Smith (1935), in reassigning this species to *Dasia*, changed the ending to the feminine form *subcaerulea*. Harikrishnan *et al.* (2012) were in error when they use the combination *Dasia subcaeruleum*.

(2) The name *Euprepes halianus* is customarily given the authorship of Haly & Nevill, which has also been followed by the authors of the two publications being dealt with (Wickramasinghe *et al.*, 2011; Harikrishnan *et al.*, 2012). This would appear to be incorrect. The article describing it, in Volume 2 of *The Taprobanian*, was unsigned, but on the cover

page of the journal we read: “Nevill., H. (Ed) (1887). The Taprobanian, A Dravidian Journal of oriental studies in and around Ceylon, in Natural history, Archaeology, Philology, History, & C. (etc.) Vol. II / Part II. Printed and Published every two months at the Education Society’s Press. London: Trubner & Co.”. The article contains the statement: “This beautiful and distinct skink has been in the Colombo museum, and the director, Mr. Haly, has kindly drawn up for me the following diagnosis; as I have had the specimens figured for this Journal, I cannot agree with him that it is better to leave them unnamed, in the case they are already described, and the description over looked by us. Unless his description and my figures be named, they cannot be registered for reference.” There follows a detailed description of the specimens, signed by Haly, but the sentence just quoted indicates clearly that Haly was not in favour of describing a new species; consequently, the person who first published the name “in a way that satisfies the criteria of availability” (Art.50.1) was Nevill alone. We here insist that the species name, author and date should be cited as *Dasia haliana* (Nevill, 1887). Incidentally, it seems to have been the case, just as it is now, that to name a species after oneself was in poor taste, making it further unlikely that Haly was one of the authors of the name.

(3) Wickramasinghe *et al.* (2011) redescribed *Dasia haliana* on the basis of an uncatalogued voucher specimen in the National Museum of Sri Lanka, and neither they nor Harikrishnan *et al.* (2012) compared their specimens with the holotype of *Dasia subcaerulea* (Boulenger, 1891) (see Fig. 1B). According to Wickramasinghe *et al.* (2011), the types of *D. haliana* were probably lost or misplaced at the National Museum of Sri Lanka during the upheavals of World War II (Kandamby 1997; Das *et al.* 1998), although they argued that a specimen still in the museum, registered as R.S.K II, might actually be one of the two syntypes. Having made this interesting claim which is not unlikely, it is curious that they went on to argue that a specimen at the Natural History Museum, London, registered as BMNH 1908.3.19.3, “from Ceylon presented by Prof. Graham Kerr, accessioned on the 19 March 1908, having SVL 68mm and a tail length of 57mm (pers. comm. Colin McCarthy 2007)” and in other respects so closely recalls the type description that it “can be confidently placed as that of the adult type specimen, and we thus place this specimen of BMNH as the lectotype of *D. halianus*” (see Fig. 1A). For this designation to have any standing, it would be necessary to show that the specimen in question was one of the two syntype specimens listed by Nevill’s short article, and had been sent from the National Museum of Ceylon (as it then was) to the then British Museum (of Natural History) between 1887, when it was mentioned as being in the former institution, and early 1908. In the absence of any such evidence, we must doubt whether the BMNH specimen is the same as either of the two listed by Haly, and reject Wickramasinghe *et al.*’s (2011) lectotype designation because according to Art.74.2, the lectotype must be chosen from the syntypes.

Harikrishnan *et al.* (2012) erroneously stated the generic authorship of the genus *Dasia* in their title and abstract as “*Dasia* Gray, 1830”, which in fact should have been *Dasia* Gray, 1839 as mentioned by themselves in a different place in their paper. Incidentally, Biswas and Sanyal (1977) have also erroneously mentioned the year of the same generic description as “*Dasia* Gray, 1889” (sic.).

(4) Wickramasinghe *et al.* (2011: 1967) stated that “Type specimens of *D. subcaeruleum*, are found at the BMNH, under the following numbers 1946.8.15.55 (Image 5), and 1949.1.8.51 (Greer, 1970)”, which implies that *D. subcaerulea* has a syntype deposited at BMNH. As a matter of fact, Greer (1970) nowhere mentions the museum registration numbers of the material he examined, merely stating that “Only two specimens of the South Indian *subcaerulea* are known” (1970:6). Moreover Harikrishnan *et al.* (2012: 44) despite having “revisited the original descriptions” claimed the presence of a paratype of *Dasia subcaerulea* which was collected by Angus F. Hutton. However, on page 38, Harikrishnan *et al.* (2012) say “Boulenger (1891) described *D. subcaeruleum* from Bodinaikanur, Madurai District, India (as *Lygosoma subcaeruleum* Boulenger, 1891), based on a single specimen donated to the British Museum by Mr. H. S. Ferguson. Subsequently, Angus F. Hutton collected a specimen of this species from the High Wavy Mountains, ca. 16 km southeast of the type locality.” Smith (1949) in his article titled “Notes on a second specimen of the skink *Dasia subcaerulea* from Southern India” clearly mentioned that “Mr. Hutton has now obtained a second specimen...” thus implying that the second specimen of *D. subcaerulea* reported in his article was collected c.a. 58 years after the publication of the original description of this species by Boulenger (1891), who passed away in 1937. The confusions caused by Harikrishnan *et al.* (2012) are clarified herein by stating that BMNH 1946.8.15.55 collected from Bodinaikanur, presently in Madurai district, Tamil Nadu, India, at an altitude of 1100 feet (ca. 335 m), is the holotype of *Lygosoma subcaeruleum* Boulenger, 1891 by monotypy (i.e., the sole specimen on which the definition of the species was based); and BMNH 1949.1.8.51, collected by Angus F. Hutton from High Wavy Mountains, Madurai district, Tamil Nadu State, India, at an altitude of 5700 feet (ca. 1700 m), is not a type of this taxon and is thus, just a voucher specimen.

(5) In the list of the chresonyms (sensu Smith & Smith, 1972) given by Harikrishnan *et al.* (2012) for the species *Dasia subcaerulea*, the original combination *Lygosoma subcaeruleum* Boulenger, 1891 is missing, and they included “*Dasia subcaerulea* Smith, 1935, 1949” and “*Dasia subcaeruleum* Das, 1996” as synonyms of *Dasia subcaerulea*. Neither Smith (1935, 1949) nor Das (1997) described the above species; they were actually “subsequent users” of the taxon names sensu ICZN 1999. Art. 51.2.1 of the Code mandates that “The name of a subsequent user, if cited, is to be

separated from the name of the taxon in some distinctive and explicit manner” (such as a dash, or the word *sensu*) and should not resemble “taxon authorship” (Art. 51.2). To clarify this, we here provide the updated list of chresonymy (referring to taxonomic publications only) for *Dasia haliana* (Fig. 1A,D), *Dasia subcaerulea* (Fig. 1B), and *Dasia johnsinghi* (Fig. 1C, F).

***Dasia haliana* (Nevill, 1887)**

Euprepes halianus Nevill 1887

Thecomyx halianus (sic.)—Annandale 1906

Lygosoma (Keneuxia) halianus (sic.)—Deraniyagala 1931

Dasia haliana—Smith 1935

Dasia halianus (sic.)—Wickramasinghe *et al.* 2011

***Dasia subcaerulea* (Boulenger, 1891)**

Lygosoma subcaeruleum Boulenger, 1891

Dasia subcaerulea—Smith 1935; 1949

Dasia subcaerulea (sic.)—Smith 1937

Dasia subcaeruleum (sic.)—Das 1997; Wickramasinghe *et al.* 2011; Harikrishnan *et al.* 2012

***Dasia johnsinghi* Harikrishnan, Vasudevan, de Silva, Deepak, Kar, Naniwadekar, Lalremruata, Prasoon & Aggarwal, 2012**

Dasia johnsinghi Harikrishnan, Vasudevan, de Silva, Deepak, Kar, Naniwadekar, Lalremruata, Prasoon & Aggarwal, 2012

Dasia haliana (non *Euprepes halianus* Nevill, 1887)—Vickram & Johnsingh 1985 part

Dasia haliana—Joshua & Sekar 1985 part; Karthikeyan 1991 part, Somaweera & Somaweera 2009 part

Dasia subcaeruleum (non *Lygosoma subcaeruleum* Boulenger 1891)—Wickramasinghe *et al.* 2011 part

(6) Harikrishnan *et al.* (2012:45) redescribed *Dasia subcaerulea* on the basis of a single specimen registered as ZSIC25945, collected by M.S. Chaitra from Singsar game road, Kudremukh National Park, which is > 500 km north of the type locality of *D. subcaerulea*. However, they erroneously mention the registration number of this specimen to be BNHS 363 in their appendix of specimens examined. As the authors were unable to examine the holotype of *Dasia subcaerulea*, they obtained photographs and data from the Natural History Museum, London, where it is housed. They state to have assigned their new specimen from Kudremukh to *D. subcaerulea* based “only on external morphological characters”. The photographs of the holotype in Harikrishnan *et al.* (2012: 46) (and in Wickramasinghe *et al.*, 2011: 1967) clearly depict the prefrontals being in broad contact with each other, completely preventing contact between the frontal and fronto-nasal. In the specimen of *D. subcaerulea* from Kudremukh (ZSIC 25945) the prefrontals are separated from each other, enabling contact between the frontal and fronto-nasal, as stated by the authors themselves (Harikrishnan *et al.* 2012: 45). In addition, there are differences in the number of midbody scale rows [28 as recorded by Smith (1949) vs. 26 in Harikrishnan *et al.* (2012)]. This is especially ironic considering that the authors themselves have used prefrontal midline contact and midbody scale rows as diagnostic characters in their own key to distinguish species of *Dasia*, and have also genetically tested distributional outliers (see *D. olivacea* vs. *D. cf. olivacea*). While it is known that *Dasia* species are rare to encounter in south India (personal observations), the mismatch of these significant and diagnostic morphological characters coupled with the very distant and ecologically heterogeneous collection localities (Bodinayakanur: 10.02° N, 77.35° E, 353 m asl. vs. Kudremukh: 13.21° N, 75.18° E, 750 m asl.), across a significant bio-geographic barrier, the Palghat gap, raise serious doubt on the veracity of their allocation of ZSIC 25945 to *D. subcaerulea sensu* Smith (1949). This allocation impacts the concept of *D. subcaerulea*, and hence the phylogeographic implications presented by the authors. As ZSIC 25945 is currently an outlier to *D. subcaerulea sensu* Smith (1949), both morphologically and geographically, it would be important to seek topotypic specimens of *D. subcaerulea* and of populations from between the type locality and Kudremukh.

Moreover, the number of congeners in the genus *Dasia* was repeatedly misinterpreted by Harikrishnan *et al.* (2012). In the first line of their introduction they mentioned “The genus is presently composed of seven valid species ...”, but the map placed right below the above statement shows eight valid species (even excluding *Dasia cf. olivacea* and their new species *D. johnsinghi* which was described in that paper). Again in their discussion they misinterpreted the number of congeners in *Dasia* as “The description of *D. johnsinghi* **sp. nov.** from the southern Western Ghats brings the total number of *Dasia* species to eight ...” (see Harikrishnan *et al.* 2012: 48)”. All of the above statements are erroneous, bringing the total species to nine including their new species, *D. johnsinghi*.

We emphasize the importance of inferences made in taxonomic papers, which will be applied by other “end-users” such as ecologists and conservation managers. Hence, a more cautious approach towards sensitive taxonomic and nomenclatural issues is needed. Ironically, the errors that we have highlighted here recall the concerned criticism raised by Vasudevan *et al.* (2007) for taxonomic papers being “pernicious” by publishing “inaccurate and imprecise” descriptions that will hinder the progress in taxonomy. Such mistakes have unwittingly appeared in a number of recent research publications, and several examples in this region have been highlighted recently (Pethiyagoda, 2007). We recommend a cautious approach towards sensitive taxonomic issues and insist that taxonomic papers should undergo a thorough peer review by practicing taxonomists (Alberts *et al.* 2008; Bahir 2009; Bahir & Gabadage 2009), thereby minimizing the possibilities for such mistakes in future.

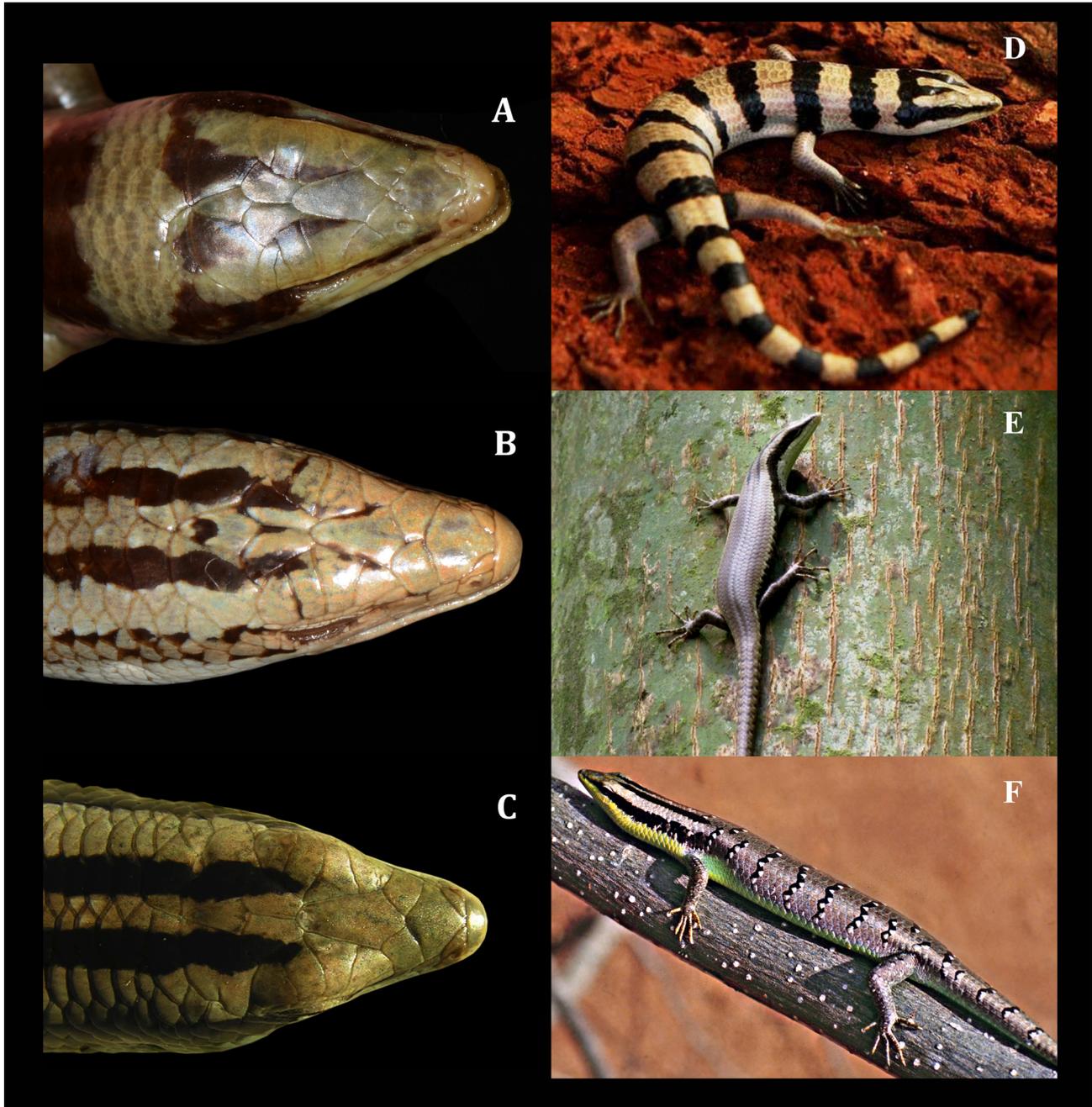


FIGURE 1. (a) a specimen of *Dasia haliana* (BMNH 1908.3.19.3), which was designated as the lectotype of *D. haliana* by Wickramasinghe *et al.* (2011), photo: P. D. Campbell; (b) the holotype of *Dasia subcaerulea* (BMNH 1946.8.15.55), photo: P. D. Campbell; (c) the holotype of *Dasia johnsinghi* (ZSIC 25946), reproduced from Harikrishnan *et al.* (2012) © Zootaxa; (d) *Dasia haliana* from Anuradhapura, Sri Lanka, photo: C. Amarasinghe; (e) *Dasia cf. subcaerulea* from Agumbe, Central Western Ghats, India, photo: R. Sreekar; (f) *Dasia johnsinghi* from Kalakkad Mundanthurai Tiger Reserve, India, photo: S. Karthikeyan.

Acknowledgements

We would like to thank Colin P. Groves, Eric N. Smith, Mohomad M. Bahir, S. R. Ganesh, and five anonymous reviewers for their critical comments to improve the manuscript. Finally we thank S. Karthikeyan, R. Sreekar, Chamara Amarasinghe and Patrick D. Campbell for photographs of *Dasia johnsinghi*, *Dasia cf. subcaerulea*, *Dasia haliana* and the specimens at the BMNH respectively.

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