

The Ecuadorean jumping spiders of Andreas Kay (Araneae: Salticidae)¹

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Andreas Kay (1963-2019) was a skilled observer and photographer who posted many images of the varied wildlife of Ecuador on the internet, including many of the most colorful jumping spiders to be found there. He did a great deal to make this work accessible to the public, and his internet presence lives on through a number of active sites (Table 1).

Table 1. Some sites linked to the photography of Andreas Kay.

site	link
Facebook	https://www.facebook.com/EcuadorMegadiverso
Facebook	https://www.facebook.com/andreas.kay.71
flickr	https://www.flickr.com/photos/andreaskay/
iNaturalist	https://ecuador.inaturalist.org/people/andreaskay
Project Noah	https://www.projectnoah.org/users/Andreas+Kay
Twitter	https://twitter.com/ecuadormacro
YouTube	https://www.youtube.com/AndreasKay
andreaskay.org	http://andreaskay.org

Andreas Kay obtained an undergraduate degree in biology from the University of Cologne, Germany, in 1989. Five years later (1994) he received his Ph.D. from the Department of Chemistry at the Swiss Federal Institute of Technology in Lausanne. Prior to his move to Ecuador in 2011, he conducted research in physical chemistry, to include artificial photosynthesis, hydrogen production with solar energy, and rechargeable batteries. However, in Ecuador (2011-2019) Andreas Kay became an independent biologist and photographer, observing and recording the wildlife of Ecuador in at least 15 different nature reserves on both sides of the Andes (andreaskay.org 2021).

Although I am not certain of the locality of each jumping spider photograph posted by Andreas Kay, he spent much of his time in Ecuador in natural areas near Mindo, on the eastern side of the Chocó rainforest of northwestern Ecuador, and, later, near Puyo, on the western side of the Amazon rainforest (Figure 1).

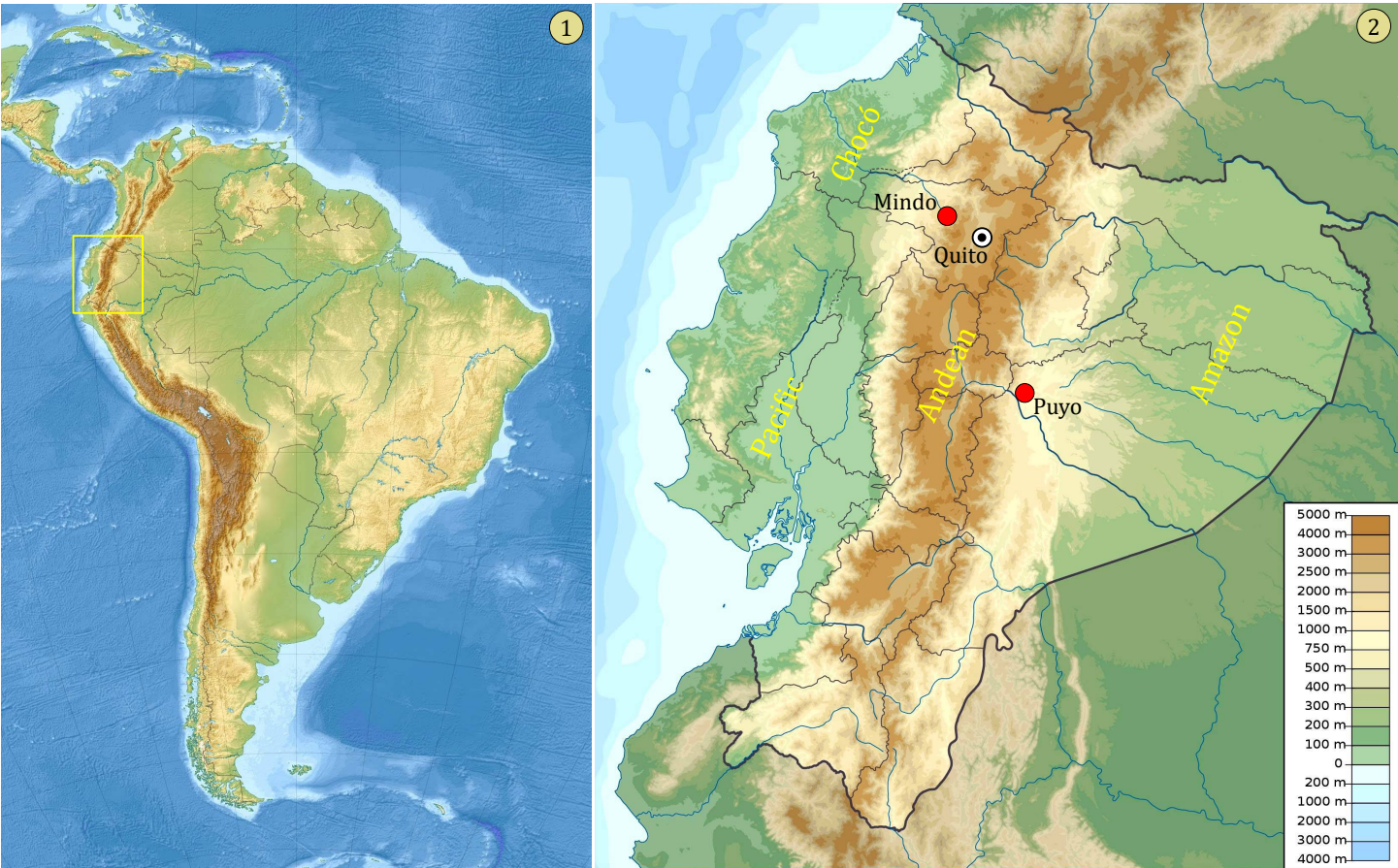


Figure 1. Geography of Ecuador. **1**, Equatorial position of Ecuador in northwestern South America (inset). **2**, Major geographic regions of Ecuador. Tropical (evergreen) forest can be found in the Chocó and Amazon Regions, separated by the high Andes. Many transitional ecoregions have also been identified (Hazzi et al. 2018; Noh et al. 2020). Map credits: 1, © Uwe Dederling, used under a Creative Commons Attribution-Share Alike 3.0 Unported ([CC BY-SA 3.0](https://creativecommons.org/licenses/by-sa/3.0/)) license; 2, Public Domain.

The modern Neotropical salticid fauna is dominated by seven clades, mostly endemic to South America (Figure 2). Of these groups, the Dendryphantini (Figure 2:7) have also diversified greatly in subtropical to temperate North America, where they represent a large part of the salticid fauna (Hill & Edwards 2013).

1.	2. Subfamily Lyssomaninae			
	3. Subfamily Spartaeinae: Tribe Lapsiini			
4. Subfamily Salticinae	5. Amycoida			
	6. Salticoida	7. Marpissoida: Tribe Dendryphantini		
		8. Saltafresia: Simonida	9. Tribe Euophryini	10. <i>Illargus</i> group
				11. <i>Maeota</i> group
			12. Tribe Aelurillini: Subtribe Freyina	

Figure 2. Hypothetical phylogeny (from left to right) of the *major* clades of Neotropical salticids, based on multiple sources (Maddison et al. 2014, 2017; Maddison 2015, Zhang & Maddison 2015). Clades that are primarily endemic to South America are colored in light green. Division of the Euophryini follows Zhang & Maddison (2015), which proposes a different phylogeny from that presented in an earlier paper (Zhang & Maddison 2013). Other groups in the Euophryini are predominantly Australasian. The Neotropical *Illargus* group includes *Amphidraus*, *Coryphasia*, *Ecuadattus* and others. The Neotropical *Maeota* group includes *Agobardus*, *Anasaitis*, *Chapoda*, *Corythalia* and others.

Below, selected photographs by Andreas Kay (Figures 3-32) represent some of the most colorful of the salticid spiders of Ecuador. In many cases the detail represented in these images is remarkable and informative, but there is no attempt here to cover the full diversity of salticids in Ecuador, a land of many different ecosystems.

Lyssomaninae

(Figure 3)

The genus *Lyssomanes* Hentz 1845 includes 94 named species, 13 from Ecuador (WSC 2021). It is sister to the smaller genus *Chinoscopus* Simon 1901, comprised of 4 species, 2 from Ecuador. W. P. Maddison recently named a new genus with 1 species from Ecuador, *Sumakuru* Maddison 2016. Field identification of most species in this group is difficult, and a comprehensive revision of the entire subfamily is needed.



Figure 3. Female *Lyssomanes* representing at least two different species (1, 2-4).

Lapsiinae

W. P. Maddison has recently published three papers dealing with this uniquely Neotropical spartaeine clade, including the genera *Galianora* Maddison 2006, *Lapsias* Simon 1900b, and *Thrandina* Maddison 2006, all known from Ecuador (Maddison 2006, 2012, 2019).

Amycoidea

(Figures 4-14)

Comprehensive studies of this large Neotropical clade are available (Bustamante, Maddison & Ruiz 2015; Ruiz & Maddison 2015). The Amycoidea are divided into nine tribes, including the Gophonini, Sarindini and Amycini (Maddison 2015). One tribe, the Sitticini, has diversified across the Holarctic realm (Maddison et al. 2020).



Figure 4. Male *Colonus* F. O. Pickard-Cambridge 1901 (Tribe Gopphonini) representing two different species. See Hill (2018) for information about this widely-distributed genus.



Figure 5. Two views of a female *Colonus* (Tribe Gopphonini) with a captured reduviid.



Figure 6. Two views of a male *Sarinda* Peckham & Peckham 1892 (Tribe Sarindini).



Figure 7. Six views of a male *Amycus* C. L. Koch 1846 (Tribe Amycini).



Figure 8. Feeding *Amycus* (Tribe Amycini).



Figure 9. Male cf. *Noegus* Simon 1900a (Tribe Amycini).



Figure 10. Female cf. *Noegus* (Tribe Amycini) with prey. This may be the same species as the male shown in Figure 9.



Figure 11. Female *Matinta* Ruiz & Maddison 2019, in Ruiz, Maddison & Galiano 2019 (Tribe Amycini).



Figure 12. Male *Hypaeus* Simon 1900a (Tribe Amycini).



Figure 13. Four views of a female amycine, of a genus that may be undescribed.



Figure 14. Male *Encolpius* Simon 1900a (Amycini). Photographed in the Jardín Botánico Las Orquídeas, Ecuador. Except for the small PME this species resembles several lapsiines, including *Thrandina cosanga* Maddison 2012.

Dendryphantini

(Figures 15-20)

The Dendryphantini are divided into subtribes Synagelina, Itatina, Marpissina and Dendryphantina (Maddison 2015). Only the Dendryphantina are shown here. This subtribe is well-represented in South America, but has also been very successful in North America (Hill & Edwards 2013) with many species in south to southeast Asia.



Figure 15. *Fritzia muelleri* O. Pickard-Cambridge 1879 (Dendryphantina) in nest. Previously this species was reported only from Brazil and Argentina. Like many other Dendryphantina, these spiders build elaborate nests, often with multiple entrances. *F. muelleri* nests are built directly above the midrib of large leaves, positioned so that streaming rainfall flows directly over the top of the nest, with three (left, right, lower) entrances.



Figure 16. Male (1-3) and female (4-6) *Parnaenus* cf. *cyanidens* (C. L. Koch 1846), Dendryphantina. Although this genus has been revised (Scioscia 1997), differences between *P. cyanidens* and *P. metallicus* (C. L. Koch 1846) are not clear.



Figure 17. Male *Lurio cf. solennis* (C. L. Koch 1846), Amazon rainforest (Dendryphantina).



Figure 18. Female *Beata* Peckham & Peckham 1895 (Dendryphantina). 4, With captured dolichopodid fly.



Figure 19. Member of the Dendryphantina with captured leafhopper.



Figure 20. Female *Bryantella* Chickering 1946 (Dendryphantina).

Euophryini: *Illargus* and *Maeota* groups
(Figure 21)

Several recent studies have documented the great diversity of the Neotropical Euophryini (Zhang & Maddison 2012, 2013, 2015). Many of these spiders feed on ants and live close to the ground, where they would not be seen by an observer focusing on above-ground foliage. The genus *Corythalia* C. L. Koch 1850 was recently revised, in part, but only microscopic characters and not field marks were depicted in this revision (Bayer, Höfer & Metzner 2020). Here we include only a single species of this large group.



Figure 21. Male *Corythalia*.

Aelurillini: *Freyina*
(Figures 22-32)

The Freyina is a very successful, endemic group of Neotropical salticids. G. B. Edwards has recently published a comprehensive review of this group (Edwards 2015). It is quite possible that the Freyina represent diversification or radiation from a single ancestor transported from Africa to South America by the prevailing east-to-west ocean currents that link the two continents. A similar form of transport, in the Eocene, is thought to account for the introduction of caviomorph rodents and primates to South America, each group descending from a single ancestor (Poux et al. 2006).



Figure 22. Female *Phiale* C. L. Koch 1846.



Figure 23. Female *Phiale*.



Figure 24. Female *Phiale cf. gratiosa* C. L. Koch 1846.



Figure 25. Female *Phiale*.



Figure 26. Female *Phiale*.



Figure 27. Female *Phiale guttata* C. L. Koch 1846.



Figure 28. Female *Phiale*.



Figure 29. Female *Phiale*.



Figure 30. Male *Freya decorata* (C. L. Koch 1846).



Figure 31. Male *Eustiromastix* Simon 1902 from the Mindo Rainforest. Similar to *Chira* Peckham & Peckham 1896, which has banded legs I.

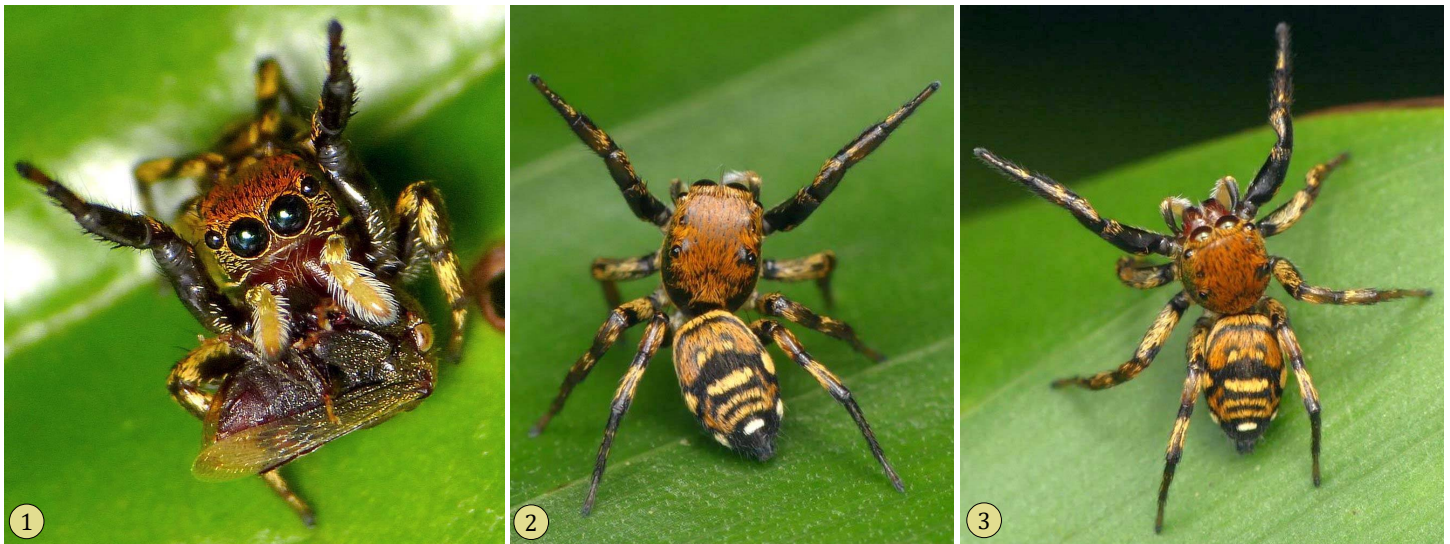


Figure 32. Female *Pachomius* Peckham & Peckham 1896.

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We are presently transitioning to an era in which many people participate in the photographic documentation of wildlife, and affordable digital macrophotography has extended this participation to the study of even small spiders. At the same time we are now made aware of our need to carefully document the field marks of these spiders in a manner that facilitates their identification by field naturalists. Over time we will see much improvement in this area.

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