ON THE SYSTEMATIC POSITION OF THE SPIDER GENUS NICODAMUS SIMON

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In every animal group there are some genera which exhibit characters normally distributed over two or more families. Such genera are stumbling blocks to taxonomers and are considered to be transitional by zoologists who see in them the strongest support for the theory of evolution. Under the influence of genetics and experimental zoology we have considerably departed from this orthodox point of view and realize now that structurally transitional characters may not mean close genetic relationship. The apparent similarity is explained on the basis of converging evolution or functional adaptation, as I prefer to term it. The transitional character of the genus becomes illusory and if the true nature of the animal is established it ceases to be placed under the one or the other family in agreement with the point of view of the systematist and is definitely given its place in the system.

Such is the case of the spider genus Nicodamus. The genus was established by L. Koch in 1872 for a Tasmanian spider and given the name Centropelma, with *C. bicolor* as type species. The generic name being preoccupied, the great French arachnologist Simon changed it in 1887 to Nicodamus, leaving it at that time in the family Theridiidæ as has been done by Koch and by his successor Count Keyserling. Since its conception and until 1898 it remained in that family. But in 1898 Simon published the second fascicle of his monumental *Histoire Naturelle des Araignées* in which he referred the genus "with some doubt" to the family Agelenidæ, adding that its "very ambiguous characters are not sufficiently outstanding (pas assez tranchés) to be used as a basis for a special family" (Translation mine—A. P.). The reason why Simon placed the genus Nicodamus among the Agelenidæ is that the five or six species belonging to it exhibit

affinity especially with Cybæus in the structure of their spinnerets and sexual organs, characters which Simon considers more important than cheliceræ and mouthparts. The analysis and description which Simon gives are very good, but contain a few slips and omissions, particularly concerning the investiture and trichobothria. Nevertheless Simon's authority was so great that Rainbow retained his classification in the Census of Australian Araneidæ, published in 1911, and I myself did the same in my paper "On Families of Spiders," in 1923, although Dahl reunited them with the Theridiidæ on the basis of the difference between them and the Agelenidæ, furnished by the distribution of the trichobothria. This character is often valuable, and I, too, have used it to some extent, but I doubt that it has such fundamental value as Dahl ascribes to it. Moreover, in the case of Nicodamus the only specimen which I had seen was not sufficiently well preserved to permit the study of trichobothria. Through the courtesy of Mr. V. V. Hickman who has sent to me a few Tasmanian spiders I was now placed in the position of subjecting to a careful study a male and a female of *Nicodamus bicolor* from Launceston, Tasmania, both specimens in excellent condition. Students of arachnology will be interested to know the result of this study.

The general appearance of both sexes, apart from their vivid color, is that of a Theridiid spider, such as a Dipoena, but with more oval abdomen. The shape of the carapace reminds more of that of Latrodectus among the Theridiidæ, than of any Agelenid that I am acquainted with. Of the eyes only the anterior median ones are diurnal, the others, though round and transparent, exhibiting a silvery white retina in artificial light. The cheliceræ are distinctly those of a Theridiid. They are without boss (condyle), are stout and parallel. Their margins are short and transverse. There is a single tooth at the juncture of the two margins, but the margins themselves are smooth and there is no scopula on either of them, but only a few stiff hairs. A stridulating ridge is wanting. The fang is short, stout and evenly curved. The maxillæ are also of the Theridiid type. They are inclined toward each other over the lip and each maxilla has parallel sides. At the end the maxillæ are so trun-

cated that their serrulæ lie in the same plane. The lip is wide at base, trapeze-shaped with straight suture. The sternum is flat, triangular, with slightly convex sides. It is almost, though not quite as wide as long, with the base of the triangle in front and the blunt apex between the hind coxæ which are separated by somewhat less than their width. The first coxæ are wide apart. In this the sternum reminds again of some Theridiids, rather than of Agelenids. The abdomen is ovoid, clothed with long, stout, black bristles. There is no stridulating organ in either sex on the abdomen. The spinnerets differ both from the typical Theridiidæ and the Agelenidæ even of the Cybæus group. With colulus and anal tubercle they form a circle, but the colulus is low and wide and bears some ten hairs which make it more apparent than it would be without them, while the anal tubercle is large and cone-shaped. The anterior pair of spinnerets is by far the stoutest. They are cone-shaped and contiguous at their base. Although Simon states that these spinnerets are composed of a single segment, he is mistaken on this point. The anterior spinnerets show distinctly a second segment separated from the first segment by a white connecting membrane. This second or terminal segment is very short and bears on the entire, slightly curved surface of its end simple spinning tubes. The pair of posterior spinnerets are wide apart at base. They are much thinner and a little, but not much longer than the anterior pair. Their second segment is longer than the first, is cone-shaped and has simple spinning tubes on its inner surface toward the end. The median pair of spinnerets is very short and stout. They are situated behind the anterior pair and are in contact with that pair and with each other. On their truncated surface they have large spinning spigots. The legs are short and stout in both sexes. Spines are present, but their distribution is irregular, or at least not as in Agelenids. The distribution of trichobothria, on the other hand, is much as in Theridiids. There are two rows of them on all tibiæ, three in one row and four in the other. There is also a single trichobothrium on all but the fourth metatarsus toward the end. In the female there are also two rows of two and three trichobothria on the tibia of the palp and in the male a single trichobothrium on the apophy-

sis of the tibia of the palp. No trichobothria elsewhere. Onychium and spurious claws wanting. Upper claws with a series of teeth, comparable to, but more numerous than in Latrodectus. Third claw smooth. Serrated bristles are present in both sexes on the fourth tarsi and even at the end of the fourth metatarsi, but the tarsal bristles do not form a distinct "comb." However, under high power the bristles exhibit their structure clearly and show a series of sharp spines all along their ventral edge. Nicodamus is herein similar to other aberrant Theridiids, but not to Agelenids. The structure of the epigynum and male palp could be of use in comparison with other spiders only if studied after clearing with potassium hydrate and oil. Too much stress has been of late laid on the structure of external organs of reproduction. They are subject to variation as much as and in some cases more than other organs. In the individual life of a spider they are the last organs to appear. Owing to the work of various investigators we know the structure and surmise the function of the various parts of the epigynum in many spiders. Of the palp we know practically nothing. The principle on which it is built is the same in all spiders. The complication of accessory structures is tremendous and their function beyond the wildest guess. Tibial apophyses have developed in various families and are not quite unknown among Theridiidæ. The spiral form of embolus is just as typical of Latrodectus and some other Theridiidæ as of some Agelenidæ. The habit of Nicodamus of living under rocks is in common with some Theridiidæ.

Considering the distinctive characters of Nicodamus and comparing them with representatives of Theridiidæ and Agelenidæ we cannot escape the conclusion that Nicodamus has practically nothing in common with the latter and a great deal in common with the former. To my mind there can be no doubt that Nicodamus is a Theridiid and allied to the Latrodectinæ from which it may be separated by the structure of its posterior spinnerets and the poor differentiation of a tarsal comb.