SYSTEMATIC POSITION OF THE GENUS *CICCABA* WAGLER

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DURING the preparation of the manuscript covering the Strigiformes for the next (fourth) volume of my 'Checklist,' some delay has ensued by reason of the large amount of compilation and the very little original research during the last fifty or seventy-five years on this interesting and difficult group of birds. It has been necessary to take an entirely fresh start; to see what generic characters of value could be used in place of the greatly overvalued characters of feathering on toes and tarsi; to examine the ear structure of all the recognized genera and of practically all the species in an effort to check up their systematic position by means of the very valuable but generally disregarded external ear characters. Naturally many instances have turned up of species in the wrong genus and even of genera in wrong subfamilies. Since the present paper deals with the result of my studies of the genera *Ciccaba* and *Strix*, which, as will presently be shown, belong in different subfamilies it may be well to give a brief review of the subfamily concepts with references to pertinent literature.

Considering the Barn Owls as constituting a distinct family, Tytonidae, we find the true owls, Strigidae, made up of two subfamilies, Buboninae and Striginae, separated on the basis of the structure of the external ear. In the second volume of the 'Catalogue of Birds in the British Museum,' 1875, page 2, Sharpe defined the subfamilies as follows:—

"*a* Ear conch not larger than the eye, without an operculum; facial disc unequal, the portion below the eye being always much greater than the area above the latter . . . . . Buboninae.

"*b* Ear conch much larger than the eye, with very large operculum shutting in the ear; facial disc always distinct and extending as far above the eye as it does below it . . . . . Syrniinae" [= Striginae].

Coues ('Key to North American Birds,' ed. 2, pp. 502–503, 1884) indicated that it might prove advisable to make the features pointed out by Sharpe the basis of two subfamilies, but was not inclined to do so himself at that time; in the fifth edition of his 'Key' which appeared in 1903, however, he definitely accepted the two subfamilies in question.

In the first volume of the 'Hand-list of Birds' (1899, pp. 280–300) Sharpe divided the Bubonidae (i.e., Strigidae) into no less than six subfamilies, basing his arrangement chiefly on a paper by Pycraft that appeared in the Transactions of the Linnean Society of London, (2), Zool., **7**: pp. 223–275, pls. 24–29, 1898. In this paper Pycraft chiefly made use of the pterylosis of some twenty species available to him in preparing a key and systematic sequence of nine or ten genera of "Asionidae;" he did not go below the

family in his classification, but Sharpe, a year later, following Pycraft's general outline, interpolated the genera that Pycraft did not deal with, in the places where he thought they should go and then divided the whole into six subfamilies. This arrangement produced such strange bed-fellows as *Nyctala* and *Surnia* in the same subfamily, and *Asio* separated from its nearest relations by a dozen or more genera to which it is not related.

Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 619–622, 1914) thus analyzed the two subfamilies in the "Key to the American genera of Bubonidae":

> "*a* External ear-opening extremely large, its vertical axis equal to at least half the greatest height of skull, crossed by a median ligament or bridge, its margin (at least the anterior one) produced into a dermal flap of greater or less width.
>
> "*aa* External ear-opening relatively small, its vertical axis much less than half of the greatest height of skull, not crossed by a ligamentous bridge nor with margin developed into a dermal flap."

Ridgway did not actually differentiate the two major subdivisions as subfamilies, in his key, but since he was not given to recognizing subfamilies, this is of no great importance, since his main heads coincide with the subfamily limits, so far as American owls go, as laid down by Sharpe.

The best account of the external ear and cranium of owls, as exemplified in certain holarctic genera and palaearctic species (*Surnia, Nyctea; Bubo bubo, Asio flammeus, A. otus, Strix aluco, S. uralense, S. lapponica, Aegolius tengmalmi* and *Glaucidium passerinum*), is by Collett (Forh. Videnskr.-Selsk. Christiania, 1881, no. 3, pp. 1–38, pls. 1–3); an English translation, edited by Shufeldt, appeared in 'Journal of Morphology,' **18**, pp. 119–176, pls. 15–20, 1900. Professor Collett's paper, originally published in Norwegian, is a most valuable contribution and it is a source of regret that its scope is not wider; ornithologists owe a debt to the memory of Dr. Shufeldt for rendering it more generally available.

With these preliminary remarks I pass now to the chief purpose of this paper: the systematic position of the genus *Ciccaba* and remarks on certain other species of owls. In 1932, Leon Kelso published a privately printed brochure of forty-seven pages entitled 'A synopsis of the American Wood Owls of the genus *Ciccaba*' (Lancaster, Pennsylvania; The Intelligencer Printing Co.). In this publication he has brought up to date the nomenclature, description, synonymy and ranges of this group of tropical American owls. For the history of the development of the genus *Ciccaba*, which was originally established by Johannes Wagler in Oken's 'Isis,' 1832, column 1222, with *Strix huhula* Daudin, as its monotypic type, one must go back to Bonaparte (Rev. et Mag. Zool., (2), **6**: 541, 1854); Sclater and Salvin ('Nomenclator Avium Neotropicalium,' 1873); Sharpe ('Catalogue of Birds in the British Museum,' **2**, 1875); Stone (Proc. Acad. Nat. Sci. Philadelphia,

1890, p. 126); Sharpe ('Hand-list,' 1: 295, 1899); Brabourne and Chubb ('Birds of South America,' pp. 76–77, 1912); and Ridgway (Bull. U. S. Nat. Mus., no. 50, pt. 6, pp. 759–768, 1914), and in addition the many shorter papers dealing with the owls of Central and tropical South America. Delving thus into the works of the past, one can get an idea of the original conception of the genus, its temporary eclipse through 'lumping' with *Syrnium* (now known as *Strix*); its reinstatement; a species added here, one removed there; new species or subspecies described, or old ones synonymized; until the net result is that presented by Kelso.

Since this work may not be generally available, I give here a brief synopsis which will also serve as a convenient reference.

Genus CICCABA Wagler

Subgenus *Ciccaba*

Ciccaba huhula (Daudin)
Ciccaba nigrolineata (Sclater)

Subgenus *Macabra* Bonaparte[1]

Ciccaba hylophila
Ciccaba albitarsus albitarsus
Ciccaba albitarsus goodfellowi
Ciccaba superciliaris superciliaris
Ciccaba superciliaris macconnelli
Ciccaba virgata centralis
Ciccaba virgata squamatula
Ciccaba virgata tamaulipensis
Ciccaba virgata virgata
Ciccaba suinda

Subgenus *Pseudociccaba* Kelso

Ciccaba aequatorialis
Ciccaba albogularis albogularis
Ciccaba albogularis meridensis

There have long been two danger signals flying that must be heeded before *Ciccaba* can be fitted into its proper systematic position. In 1875, Sharpe regarded as congeneric with *Syrnium*, all the species now referred to *Ciccaba*, placing *Syrnium* in the subfamily Syrniinae (what is now known as the Striginae). In 1914, Ridgway placed *Ciccaba* (his diagnosis apparently drawn only from the Central American forms) in the subfamily Buboninae. Thus the general conception of the genus *Ciccaba* has come to mean merely a moderate-sized tropical American owl with feathered tarsi, bare toes and no well-developed or prominent ear tufts, all this in spite of the conflicting statements as to the systematic position of the genus that might well have

[1] Kelso later found that the type of *Macabra* Bonaparte is *Syrnium macabrum* Bonaparte (= *Syrnium albogulare* Cassin) by tautonymy and proposed *Tacitathena* as a new subgenus with *Strix hylophila* Temminck as type.

aroused the suspicion that several quite unrelated species were included in it.

I have been able to examine the external ear structure of all the species commonly referred to *Ciccaba*, as well as that of all the other genera and many of the species of owls. While it is extremely easy when handling an owl in the flesh or as a well-prepared alcoholic, to examine the external ear structure and decide whether the specimen is bubonine or strigine, it is difficult even to find the ear opening in some skins; in other cases distortion in drying or damage in preparation renders an investigation of the structure unsatisfactory. The much more complex structure of the external ear in the Striginae is particularly susceptible to damage during preparation. In the absence of suitable fresh or alcoholic material, I have examined a considerable number of skins, selecting those that showed the external ear structure satisfactorily. Thus when a suitable series of any given species was found to possess only a simple small ear orifice, it has been assumed that the species was surely bubonine, and when another species uniformly possessed a large ear opening with the dermal flap demonstrable, I felt safe in assuming strigine relationships. This rather protracted examination has shown that *hylophila* must be removed from the genus *Ciccaba* altogether; it is not a *Ciccaba* at all, but a member of the genus *Strix*. The three specimens of this rare owl that I have been privileged to examine were loaned through the courtesy of the American Museum of Natural History. All three show clearly the large asymmetrical ear openings, with anterior dermal flaps just as in *Strix aluco*, *S. varia*, *S. occidentalis* and *S. fulvescens*, and I have not the slightest hesitation about removing it to *Strix*. *Tacitathena* Kelso and Kelso (Biol. Leafl., no. 7, January 15, 1937), which was erected as a subgenus with *Strix hylophila* Temminck as type, must henceforth be cited in the synonymy of *Strix* Linnaeus, unless a separation from that genus can be made.

Examination of the remaining forms has shown that all of them are bubonine, though not all are congeneric. *C. albogularis* and *C. aequatorialis* agree with *Ciccaba* in having bare toes, but here the resemblance ceases. Both birds have the distal portion of the tarsus bare as in certain neotropical species of *Otus*, both have a pair of short, rounded ear tufts partly concealed by the long, lax plumage of the head, and both have the frontal bristles much developed, reaching to the tip of the bill or beyond; furthermore the external ear openings are very small, simple and practically symmetrical. In all these respects both *albogularis* and *aequatorialis* agree with *Otus*, particularly with *O. vermiculatus*, and I have no hesitation in removing both these birds to *Otus*, placing them next to *O. vermiculatus*. Carriker (Proc. Acad. Nat. Sci. Philadelphia, **87**: 313, 1935) named *Ciccaba minima* from Bolivia. While I have not examined his type, from the fact that Mr. Zimmer showed me a specimen in the American Museum agreeing with

Carriker's original description in which he states that the nearest ally of *minima* is *C. aequatorialis* and notes the resemblance to *Otus*, it would seem that Carriker's new species also can be safely transferred to that genus, and need not be considered further in connection with *Ciccaba*. Furthermore, both *aequatorialis* and *albogularis* should be regarded as conspecific, so the forms will stand:

Otus albogularis meridensis (Chapman)
Otus albogularis albogularis (Cassin)
Otus albogularis aequatorialis (Chapman)
Otus minima (Carriker)

In his 'Synopsis,' Kelso proposed the subgenus *Pseudociccaba*, type, by original designation, *albogularis*, but this name must henceforward be considered in the synonymy of *Otus*. *Macabra* was proposed by Bonaparte in 1854 and its type was subsequently designated by Gray as *hylophila*, the first species mentioned. It transpires, however, that another one of the species originally included in *Macabra* was *Syrnium albogulare* Cassin, a synonym of which is *Syrnium macabrum* Bonaparte, 1850, hence the latter is automatically the tautonymic type of *Macabra*, since Gray's designation is invalid under those circumstances. *Macabra*, too, must therefore go into the synonymy of *Otus*.

The following species now remain in *Ciccaba: huhula, nigrolineata, albitarsus, superciliaris, virgata* and *suinda*. These form a group, alike in external characters though of rather diverse color pattern, which may be defined as moderate-sized bubonine owls, having an external ear opening of relatively larger size than in owls of similar dimensions in that subfamily, these openings slightly asymmetrical with the larger orifice on the right side; first five primaries strongly emarginated on the inner web, fourth or fifth, or fourth and fifth longest; tail slightly more than one-half of wing (about five-eighths); frontal bristles rather stiff, the terminal filaments not extending beyond the tip of the upper mandible; nostril placed at the anterior edge of the slightly swollen cere; ear tufts absent; tarsi densely feathered, toes bare.

There now remains another element to add to *Ciccaba* and this is *Noctua woodfordii* A. Smith (South African Quart. Journ., 1834, p. 312). This bird, divided into several races, inhabits the forested parts of Africa south of the Sahara and since 1850 has been carried in the genus now called *Strix*. Its systematic position has never been questioned and I was therefore quite unprepared to discover that the bird was not a strigine owl at all but a bubonine one, agreeing so closely with the genus *Ciccaba* that generic distinction does not seem to be feasible. Compared with *Ciccaba virgata*, which *woodfordii* most nearly approaches in size, we find the two have the same type of ear, virtually the same proportions of wing to tail, the same primary

formula, the same scoopings and sinuations on the five outer primaries, feathered tarsi and bare toes; with the exception of the very slightly weaker bill and feet of *woodfordii*, I am unable to detect any basis for a generic separation, and in my estimation this is far too slight a difference on which to base a genus. The removal of *woodfordii* from the genus *Strix* leaves the Ethiopian region without a single representative of the genus; its transfer to *Ciccaba* complicates the distribution of the latter and brings up the question whether there is an actual relationship between these American and African owls, or whether there exists merely a case of convergence.

It may be of interest in this connection to point out another case in the same category. *Bubo lettii* Büttikofer which inhabits the West African forest region has been placed sometimes in *Bubo*, sometimes in *Otus*, and finally came to rest in the monotypic genus *Jubula* proposed for it by Bates (Bull. British Ornith. Club, **49**: 90, 1929). While the bird is clearly neither a *Bubo* nor an *Otus* it might just as well have been transferred to the Neotropical genus *Lophostrix* Lesson instead of being placed in a monotypic genus. In fact, the only possible justification that I can find for maintaining *Jubula* is the fact that the ear openings are smaller than in *Lophostrix;* similarly, *woodfordii* has smaller orifices than *virgata*, nevertheless I should never deliberately propose a new generic name for the former on this character alone.

As I now understand *Ciccaba*, it would seem that the specific limits are too narrow, and that if they were broadened a better idea of the relationships within the group could be obtained. *C. virgata*, *C. superciliaris* and *C. suinda*[1] are without doubt representative forms and should be united as a single species ranging from northern Mexico to southern Brazil and Paraguay. In parts of South America this species has a red phase that appears to be entirely absent in Central America and northwestern South America. *C. huhula* and *C. nigrolineata* are closely allied representative species of the same size and proportions, but certain features of their markings are so dissimilar that I should hesitate to consider them conspecific. *C. albitarsus* bears a very strong superficial resemblance to *Strix hylophila*, but may be readily distinguished, even without examining the ear structure, by having the basal phalanges of the toes entirely bare (feathered in *hylophila*) and the distal portion of the outer primaries plain dusky or with only a few obsolete paler spots (instead of regularly barred with buffy).

If these proposed changes are accepted, the genus *Ciccaba* Wagler will stand as follows:

[1] Kelso and Kelso (Biol. Leafl., no. 4, p. 39, 1934) have shown very satisfactorily, that *Strix suinda* Vieillot is really not applicable to a Wood Owl, but is certainly the earliest name for the southern South American race of *Asio flammeus*, and has many years priority over *breviauris* Schlegel. *Syrnium borellianum* Bertoni will replace *Ciccaba suinda* of authors, not of Vieillot.

Ciccaba virgata tamaulipensis Phillips
Ciccaba virgata squamulata (Bonaparte)[1]
Ciccaba virgata centralis Griscom
Ciccaba virgata virgata (Cassin)
Ciccaba virgata macconnelli Chubb
Ciccaba virgata superciliaris (Pelzeln)
Ciccaba virgata borelliana (Bertoni)
Ciccaba nigrolineata Sclater
Ciccaba huhula (Daudin)
Ciccaba albitarsus albitarsus (Sclater)
Ciccaba albitarsus goodfellowi Chubb
Ciccaba woodfordii umbrina (Heuglin)
Ciccaba woodfordii nigricantius (Sharpe)
Ciccaba woodfordii bohndorffi (Sharpe)
Ciccaba woodfordii nuchalis (Sharpe)
Ciccaba woodfordii woodfordii (A. Smith)

Syrnium suahelicum and *Syrnium sansibaricum*, both described by Reichenow (in Werther's 'Die mittl. Hochlände nördl. Deutsch-Ost-Afr.,' p. 272, 1898) are synonymous with *Ciccaba woodfordii nigricantius* (Sharpe); *C. w. bohndorffi* (Sharpe) is doubtfully distinct from *nuchalis* (fide Prof. O. Neumann, *in litt.*).

To show the difference in the size and asymmetry of the external ear opening in certain species of owls, the following table is appended. It must be borne in mind that it is not always possible exactly to determine the size due to various factors involved, such as the make of skin, damage in skinning or distortion in drying.

Form	*Left ear*	*Right ear*
Ciccaba virgata virgata	11 mm.	18 mm.
Ciccaba virgata virgata	13.5	17
Ciccaba virgata virgata	10.5	17
Ciccaba virgata virgata (alcoholic)	12.5	17.3
Ciccaba virgata centralis	12.5	17
Ciccaba virgata squamulata	11.5	17
Ciccaba virgata superciliaris	11.5	19.5
Ciccaba virgata macconnelli	14.5	17
Ciccaba borelliana	16	21
Ciccaba huhula	12.5	20
Ciccaba nigrolineata	12	16.5
Ciccaba nigrolineata	13.5	20
Ciccaba albitarsus	20	23
Ciccaba albitarsus	17.5	23
Ciccaba albitarsus	20	21
Ciccaba woodfordii nuchalis	8.8	13.7

average 4 specimens.

[1] *Ciccaba virgata amplonotata* Kelso, Proc. Biol. Soc. Washington, **46**: 151, 1933 (Mazatlan, Sinaloa) is a synonym.

Form	*Left ear*	*Right ear*
Ciccaba woodfordii suahelica	9.6	12.9
average 4 specimens.		
Ciccaba woodfordii woodfordii	6.4	7.7
Ciccaba woodfordii woodfordii	9.7	13.8
Ciccaba woodfordii subsp? (alcoholic)	8.5	12.5
Otus asio naevius	10	10.5
Otus asio maxwellae	10.5	9.5
Otus asio kennicotti	11	11
Otus choliba choliba	7	6
Otus albogularis albogularis	6	8
Otus albogularis aequatorialis	7.5	7
Otus vermiculatus	7.5	8.7
Otus vermiculatus	7.7	8.5
Pulsatrix perspicillata chapmani	11.5	9.5
Pulsatrix melanota	12.5	11.5
Pulsatrix melanota	11	11
Pulsatrix melanota	10.5	12.5
Pulsatrix koeniswaldiana	11	12
Lophostrix cristata wedeli	10	11.5
Jubula lettii	7.7	7.6

The size of the external ear orifice of *Strix hylophila* Temminck, compared with two other species of strigine owls is also given herewith:

Form	*Left ear*	*Right ear*
Strix hylophila	19 mm.	24.5 mm.
Strix aluco aluco	20	23.5
Strix fulvescens	25	27.5

It will thus be seen that the asymmetrical ear openings of *Ciccaba* approach the condition found in *Strix* and other strigine owls, but lack the dermal flap characteristic of that subfamily.

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