THE SYSTEMATIC POSITION OF THE GRAY CATBIRD (*DUMETELLA CAROLINENSIS*) AS INDICATED BY ITS NASAL MITES (ACARINA: DERMANYSSIDAE, RHINONYSSINAE)

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The Gray Catbird (*Dumetella carolinensis*) is presently considered to be a mimic thrush (Mimidae: mockingbirds and thrashers) (A.O.U. 1957). However, some of its characteristics suggest an affinity with true thrushes (Turdidae: thrushes, solitaires, and bluebirds). Coues (1927) noted the resemblance of Gray Catbird eggs to those of the Robin (*Turdus migratorius*). Similarities in nest construction by the Gray Catbird, Veery (*Hylocichla fuscesens*), and the Wood Thrush (*H. mustelina*) have also been described (Nickel 1965). The catbird's maxillo-palatines and other skeletal characters resemble those of the true thrushes and it has been stated that the catbird is nearer to the true thrushes than is any other mimid (Ridgway 1907:182). Indeed, a review of the synonymies reveals that the Gray Catbird has upon occasion been placed in the genus *Turdus* (Hellmayr 1934). Beecher (1953) found the jaw muscles, bill, palate, and tongue of the mimic and true thrushes to exhibit only minor variations. He dissected the catbird but apparently did not find evidence of a close relationship with the true thrushes. McCabe and Deutsch (1952) found the electrophoretic patterns of egg white proteins of the Gray Catbird, Brown Thrasher (*Toxostoma rufum*), Robin, and Eastern Bluebird (*Sialia sialis*) to be similar but drew no conclusion as to the relationship of the catbird and the true thrushes. Clark (1972) recently noted that mockingbirds and thrashers have a single large scute at the base of the two outer toes whereas *Dumetella* and the other genera of mimids have divided scutes. Divided scutes were also found in the Turdidae and several other families of passerines.

The foregoing observations suggest that the catbird may have affinities with both the Mimidae and Turdidae. To assess the parasite evidence relating to this question we surveyed the literature on rhinonyssine mites for records of infections from mimic thrushes, true thrushes, and related groups. Specimens of these mites were studied from Pence's collection. This evidence was evaluated with respect to the current hypotheses regarding the biology and systematics of the mites.

BIOLOGY OF THE MITES

The rhinonyssine mites are closely related to the dermanyssid nest parasites of birds (Domrow 1969). Rhinonyssines are obligatory parasites with the two genera most

commonly found in passerines occupying different niches within the nasal passageways. Species of the genus *Ptilonyssus* inhabit the turbinates whereas those of the genus *Sternostoma* are found in the deeper cavities of the infraorbital area. In their natural state rhinonyssine mites are sluggish and reddish-brown to transparent depending on their state of engorgement with blood. It has been hypothesized that rhinonyssines are transferred by direct contact with infected hosts either during courtship billing or by feeding of the young (Amerson 1969). Mites have been found in the nasal passageways of nestlings (Porter and Strandtmann 1952, Terbush 1963, Amerson 1969) suggesting that the latter method is important. If indeed the transfer of mites depends on the reproductive activities of the host there should be virtually no interspecific transmission of mites. Reproductive isolation of the avian hosts should ensure that their mites are also reproductively isolated from those mites occurring in closely related species of birds. Since parasites presumably evolve at a somewhat slower rate than their hosts, the similarity of mites from different host species should serve as an index of the relationship of the hosts.

Although the systematics of rhinonyssine mites are somewhat confused, the species discussed herein are easily differentiated on the basis of the number and shape of the dorsal plates and chaetotaxy (number, arrangement and shape of setae) of the idiosoma (body) and legs. The genus *Sternostoma* is divided into two major groups depending on the presence of either one (Figs. 1–3) or two (Figs. 4, 5) dorsal plates. *Ptilonyssus euroturdi* from the Gray Catbird (Fig. 8) is separated from the two closely related species of *Ptilonyssus*, *P. mimi* and *P. toxostomae* (Figs. 6–7), occurring in other mimic thrushes by the shape of the dorsal plate and chaetotaxy of legs I and IV.

RESULTS AND DISCUSSION

The species of rhinonyssine mites infecting birds of the families Mimidae, Turdidae, and Cinclidae (Dippers) are listed in Table 1. The Gray Catbird is infected with mite species found in both the Turdidae and the Mimidae. The Gray Catbird harbors *Sternostoma dumetellae* (Pence 1972a), a species which has not been recorded from any other mimid. This mite is a member of a small complex of closely related species that includes *S. technaui* and *S. spathulatum*. These two species are recorded primarily from turdids. *Sternostoma dumetellae* is differentiated from *S. technaui* and *S. spathulatum* on the basis of differences in chaetotaxy (Pence 1972a) (Figs. 1–3).

Sternostoma kelloggi is reported from the Gray Catbird (Hyland and

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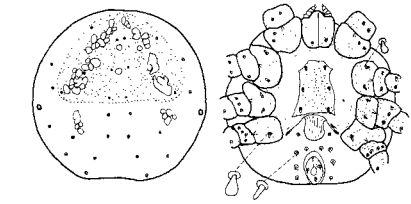
FIGS. 1–8. Rhinonyssine nasal mites from North American mimic and true thrushes. 1. Dorsal and ventral view of idiosoma, respectively, of *Sternostoma dumetella* from Catbird. 2. Same as above, *S. technaui* from American Robin. 3. Same as above, *S. spathulatum* from Hermit Thrush. 4. Dorsal and ventral views of idiosoma, respectively, and ventral view of tarsus IV of *S. hutsoni* from Swainson Thrush. 5. Same as above, *S. kelloggi* from Brown Thrasher. 6. Dorsal view of leg I, ventral view of leg IV, and dorsal and ventral views, respectively, of idiosoma of *Ptilonyssus toxostomae* from Brown Thrasher. 7. Same as above, *Ptilonyssus mimi* from Mockingbird. 8. Same as above, *Ptilonyssus euroturdi* from Catbird.



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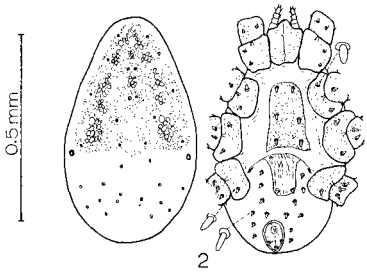

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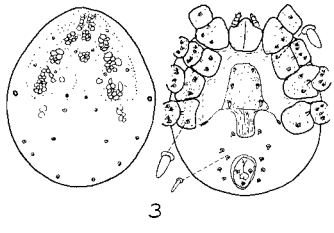

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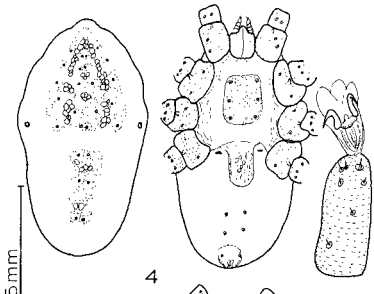

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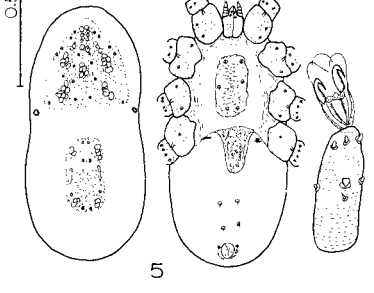

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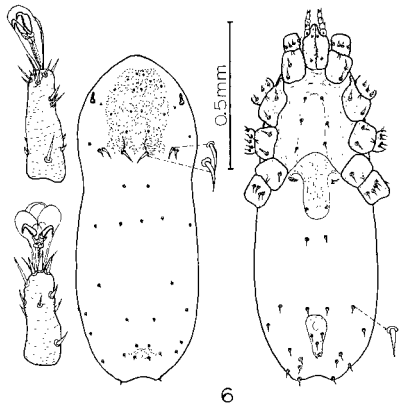

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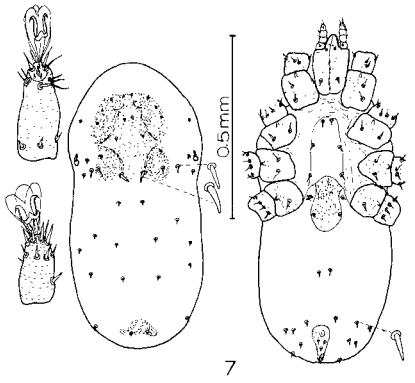

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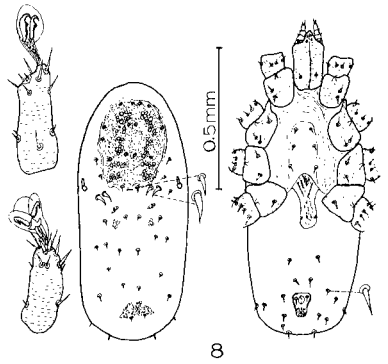

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TABLE 1

RHINONYSSINE MITES INFECTING BIRDS OF THE FAMILIES MIMIDAE, TURDIDAE, AND CINCLIDAE

Mite Species	Host Species	Locality	Authority
	Turdidae		
Sternostoma			
dureni	*Oreocinclata lunulata*	Australia	Domrow 1969
	Turdus olivaceus	Africa	Fain 1957
S. hutsoni	*Hylocichla ustulata*	California	Furman 1957
	Turdus nudigenis	Trinidad	Fain and Aitken 1967
S. sialiphilus	*Sialia sialis*	Michigan	Hyland and Ford 1961
		Louisiana	Pence 1972a
S. spathulatum	*Hylocichla fuscescens*	Cuba	Černý and Dusbàbek 1970
	H. guttata	Louisiana	Pence 1972a
	H. ustulata	California	Furman 1957
S. technaui	*Mimocichla plumbea*	Cuba	Dusbàbek 1969; Černý and Dusbàbek 1970
	Oreocinclata lunulata	Australia	Domrow 1969
	Turdus ericetorum	Belgium	Fain 1963
	T. fumigatus	Trinidad	Fain and Aitken 1967
	T. migratorius	Louisiana	Pence 1972a
	T. musicus	Belgium	Fain 1963
	T. nudigenis	Trinidad	Fain and Aitken 1967
	T. olivaceous	Africa	Zumpt and Till 1955
	T. pilaris	Belgium	Fain 1963
Ptilonyssus			
euroturdi	*Hylocichla mustelina*	Louisiana	Pence 1972b
	Mimocichla plumbea	Cuba	Černý and Dusbàbek 1970
	T. ericetorum	Belgium	Fain and Hyland 1963
	T. fumigatus	Trinidad	Fain and Aitken 1967
	T. merula	New Zealand	Domrow 1972
	T. nudigenis	Trinidad	Fain and Aitken 1967
	T. philomela	New Zealand	Domrow 1972
	T. viscivorus	Belgium	Fain and Hyland 1963
P. afroturdi	*T. olivaceus*	Africa	Fain 1962
P. sialiae	*Sialia currucoides*	Texas	George 1961
	Mimidae		
S. dumetellae	*Dumetella carolinensis*	Louisiana	Pence 1972a
S. kelloggi	*D. carolinensis*	Michigan	Hyland and Clark 1959
	Mimus polyglottos	Cuba	Černý and Dusbàbek 1970
	Toxostoma rufum	Louisiana	Pence 1972a
P. euroturdi	*Dumetella carolinensis*	Michigan	Fain and Hyland 1963
		Louisiana	Pence 1972b
P. mimi	*Mimus polyglottos*	Texas	George 1961
		Louisiana	Pence 1972b
P. toxostomae	*Toxostoma rufum*	Louisiana	Pence 1972b

TABLE 1 (continued)

Mite Species	Host Species	Locality	Authority
	Cinclidae		
S. technaui	*Cinclus cinclus*	Europe	Vitzthum 1935, Fain 1963
	C. pallasi	Russia	Bregetova 1965

Clark 1959), Brown Thrasher (Pence 1972a), and Mockingbird (Černý and Dusbàbek 1970). Although *Sternostoma kelloggi* is a distinct species, it is closely related to *S. hutsoni*, *S. sialiphilus*, and *S. dureni* from New and Old World turdids (Furman 1957, Fain 1957, Fain and Aitken 1967, Hyland and Ford 1961) (Figs. 4–5).

Records of the genus *Ptilonyssus* further substantiate the relationship of the Gray Catbird with the Turdidae. The single species recorded from the Gray Catbird is *P. euroturdi*. This species has also been recorded from a variety of turdids in both the New and Old World (Fain and Hyland 1963, Fain and Aitken 1967, Pence 1972b, Domrow 1972) (Fig. 8). A similar species, *P. afroturdi*, has been reported from an African turdid (Fain 1962). The species of *Ptilonyssus* from the Mimidae are represented by two very closely related forms, *P. mimi* and *P. toxostomae*. These two species are quite distinct from *P. euroturdi* with major differences in both the chaetotaxy and shape of the dorsal plates (Figs. 6–8). These species are reported from the Mockingbird and Brown Thrasher in North America, respectively (George 1961, Pence 1972b). An additional species, *Ptilonyssus sialiae*, described from the Mountain Bluebird (*Sialia currucoides*) (George 1961) is not morphologically related to the above forms. Thus, on the basis of evidence from its rhinonyssine mites the Gray Catbird appears to have affinities with both the Mimidae and Turdidae. The morphological relationships of these mites are illustrated in Figs. 1–8.

Ridgway (1907) believed that the Turdidae, Mimidae, and Cinclidae were related families. Beecher (1953) recognized the Turdinae, Miminae, and Cinclinae as subfamilies of the Turdidae. The parasite evidence supports systematic association of these three groups. *Sternostoma technaui* is recorded not only from mimids and turdids, but also from *Cinclus cinclus* in Europe (Vitzthum 1935) and *Cinclus pallasi* in Russia (Bregetova 1965).

The alleged relationship of the Mimidae and the Troglodytidae (Wrens) (Coues 1927, Hohn 1973) is not supported by this parasite evidence. Three species of *Ptilonyssus* have been reported from wrens. *Ptilonyssus salpinctis* is described from the Rock Wren (George 1961), *P. troglodytis* from the

Winter Wren (Fain 1964), and *P. thyrothori* from the Carolina Wren (Pence 1972b). These species do not appear to be closely related to those species of *Ptilonyssus* reported from the mimids.

A major problem in determining avian affinities from parasite evidence is the lack of precise information on host specificity and other host-parasite relationships. Inferences must necessarily be drawn from incomplete collection records and inadequate knowledge of the biology and systematics of both the host and its parasites. The criticism of Stresemann (1959) concerning the exaggerated use of parasite evidence is justified. This host-parasite information should be considered in proper perspective and in concurrence with that derived from all other contributing disciplines. The parasite evidence for the relationships of the birds discussed herein assumes an acarine infection of the ancestral hosts and the evolution of a mode of transfer that precludes interspecific transmission between hosts. Should additional studies demonstrate the validity of the assumptions, the rhinonyssine mites may well become an additional tool for use in avian systematics.

SUMMARY

The rhinonyssine nasal mite literature was surveyed for records of infection of the Mimidae, Turdidae, and related groups and these data were evaluated with respect to the systematic position of the Gray Catbird (*Dumetella carolinensis*). The Gray Catbird harbors *Sternostoma dumetellae*, a species not recorded from other mimids but closely related to *S. technaui* and *S. spathulatum* which are recorded from the Turdidae and Cinclidae. *Sternostoma kelloggi* from the Gray Catbird, Brown Thrasher, and Mockingbird is a distinct species but again closely related to *S. hutsoni*, *S. siaphilus*, and *S. dureni* from the New and Old World Turdidae. *Ptilonyssus euroturdi* from the Gray Catbird is also found in a number of turdids in both the New and Old World. Thus, the parasite evidence suggests that the Gray Catbird has affinities with both the Mimidae and Turdidae. The occurrence of *Sternostoma technaui* in the Mimidae, Turdidae, and Cinclidae also suggests relationship among these families.

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NEW LIFE MEMBER

A new addition to the list of life members of the Wilson Ornithological Society is Dr. Pershing B. Hofslund. Dr. Hofslund has held four offices in the Wilson Society and was President of our Society from 1971–1973. He has been editor of The Flicker, president of the Minnesota Ornithological Union, and is an elective member of the AOU. Dr. Hofslund's principal interests in ornithology include hawk migration and wood warbler life histories; he has published approximately 75 of his studies. Presently Professor of Biology at the University of Minnesota, Dr. Hofslund is also active with the Arrowhead Zoological Society and is on the State Board of the Minnesota Zoological Gardens. Dr. Hofslund is married and has two children.