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Parasites of the Snail Kite in Florida and summary of those reported for the species.—The Snail Kite (*Rostrhamus sociabilis*) ranges from Florida, Cuba, and southeastern Mexico south to southern South America (Hellmayr and Conover 1949, Friedmann 1950, Sykes 1984). Here we report for the first time the parasites of *R. s. plumbeus* in Florida and list parasites known for the species elsewhere. Our findings were not the result of a detailed study but were an adjunct to a broader research effort on Snail Kite ecology.

Ectoparasites, fresh fecal samples, and blood smears were collected from nests and nestling Snail Kites in Florida, as the opportunity arose, from 1969 through 1975. We collected 38 samples in Conservation Area 2A, Broward County (2 ectoparasite collections), Lake Okeechobee, Glades County (13 blood smears, 10 fecal samples, 1 ectoparasite collection), and headwaters of the St. Johns River, Indian River and St. Lucie counties (6 blood smears, 1 fecal sample, 5 ectoparasite collections). Techniques of preparing, culturing, and examining samples followed Forrester et al. (1974). No necropsies were performed for endoparasites. No material was obtained from birds capable of flight because we felt that the stress of capture was too great a risk in the relatively small population in the 1969-1975 period.

R. sociabilis is a known host for 11 species of ectoparasites (9 biting lice, 1 mite, and 1 beetle) and 6 endoparasites (5 flukes and 1 protozoan) (Table 1). All blood smears were negative for blood protozoans. Two fecal samples from nests at Lake Okeechobee, Glades County, in 1974 and 1975 contained oocysts

TABLE 1. Parasites for which the Snail Kite (*Rostrhamus sociabilis*) is a known host.

Parasite	Substrate on host	Locality of host	Reference
Ectoparasites			
Mallophaga (biting lice)			
Craspedorrhynchus obscurus (Giebel)[1]	feathers	Argentina	Lahille 1920, Guimaraes 1943
Craspedorrhynchus obscurus	feathers	Colombia	Carriker 1956
" "	feathers	North America	Malcomson 1960
" "	feathers	Guyana	Bodkin and Cleare 1916
Degeeriella sp.	feathers	Guyana	"
Columbicola columbae (Linnaeus)[2]	feathers	Guyana	"
Menacanthus sp.	feathers	Guyana	"
Neocolpocephalum flavescens	feathers	Not known	Eichler 1937
Colpocephalum maculatum Piaget	feathers	Guyana	Bodkin and Cleare 1916
Colpocephalum ibicter (Eichler)	feathers	Guyana	Price and Beer 1963
Colpocephalum turbinatum Denny[3]	feathers	Surinam	"
Colpocephalum turbinatum Denny	feathers	Cuba	"
Colpocephalum turbinatum Denny	feathers	Guyana	Bodkin and Cleare 1916
Colpocephalum turbinatum Denny	feathers	Florida	This paper
Falcolipeurus quadriguttatus (Giebel)	feathers	North America	Malcomson 1960
Falcolipeurus quadriguttatus (Giebel)	feathers	Florida	This paper
Acarina (mites and ticks)			
Ornithonyssus bursa (Berlese)	feathers, nests	Florida	This paper

Parasite	Substrate on host	Locality of host	Reference
Coleoptera (beetles)			
Dermestes nidum	skin & muscle tissues ventral side of nestlings, nests	Florida	Snyder et al. (in press)
Endoparasites			
Digenea (flukes)			
Echinostoma armatum Fuhrmann	intestines	Brazil	Fuhrmann 1904
Notocotylus lopezneyrai Dubois and Pérez Vigueras	intestines	Cuba	Dubois and Pérez Vigueras 1953
Prionosoma malacophilum Pérez Vigueras	intestines	Cuba	Pérez Vigueras 1944
Bothrigaster variolaris (Fuhrmann)[4]	abdominal cavity & intestines	Brazil	Fuhrmann 1904 Travassos 1923
Bothrigaster variolaris (Fuhrmann)	"	Cuba	Dubois 1959
Bothrigaster variolaris (Fuhrmann)	nasal fossa & sinuses	Cuba	Pérez Vigueras 1940, 1955
Unidentified to species	lungs	Not known	Grossman and Hamlet 1964
Coccidia (parasitic protozoans)			
Coccidia *Eimeria* sp.	intestinal epithelium & feces	Florida	This paper

[1]*Philopterus obscurus* Giebel is a synonym of *Craspedorrhynchus obscurus.*
[2]*Lipeurus baculus* N. is a synonym of *Columbicola columbae.*
[3]*Colpocephalum dissimile* Piaget is a synonym of *Colpocephalum turbinatum.*
[4]*Ophthalmophagus variolaris* Dubois and *Spaniometra variolaris* (Fuhrmann) are synonyms of *Bothrigaster variolaris.*

of an *Eimeria* coccidian. Although the six oocysts found were insufficient to attempt a description, they likely represent a new species, because no published reports of coccidia from the Snail Kite exist and coccidia are among the most host-specific parasites.

Biting lice, *Colpocephalum turbinatum* and *Falcolipeurus quadriguttatus*, have been reported on Snail Kites outside the United States but were not previously known from kites in Florida. We obtained both from nestlings on the headwaters of the St. Johns River, Indian River County. Four species of biting lice listed in Table 1 are primarily parasites of non-raptors, so their occurrence on Snail Kites is interesting. *Columbicola columbae* is primarily found on Columbiformes, *Menacanthus* spp. on Galliformes, Piciformes, and Passeriformes, and *Colpocephalum ibicter* and *C. turbinatum* on Columbiformes (Bodkin and Cleare 1916, Price and Beer 1963). We believe Snail Kite interactions with other avian species are the source of contamination by these non-raptorial parasites. Contamination probably occurs at communal mixed species roosts where there is momentary contact with other birds and falling feathers. Another possible source of contamination is contact with antagonistic passerines. In Florida, Eastern Kingbirds (*Tyrannus tyrannus*) and male Red-winged Blackbirds (*Agelaius phoeniceus*) in aggressive defense of their breeding territories will on occasion alight for several seconds on the back of a Snail Kite as the raptor flies slowly past. Boat-tailed Grackles (*Quiscalus major*) often attempt to steal apple snails (*Pomacea paludosa*) from kites while the kites perch to feed, affording an opportunity for contact. Similar contacts with other species of birds probably occur throughout the range of the Snail Kite.

A Snail Kite nest in the northern part of Cloud Lake (Minute Maid) Reservoir in northeastern St. Lucie County contained two young on 26 April 1974, estimated to be one and three days old. By 14 May only one nestling was alive and remains of its sibling were lodged in the side of the structure, having died about 14 days before. The surviving nestling was weak, and the bird and its nest were swarming with thousands of mites. On 21 May the nest was empty, still heavily infested with mites, and the lone nestling was assumed to be dead. The mites collected on 14 May were tropical fowl mites (*Ornithonyssus bursa* (Berlese), Family Macronyssidae). This is the first time this ectoparasitic mite has been found on *R. sociabilis* although it occurs on poultry, sparrows [probably the House Sparrow (*Passer domesticus*)], myna, and man. It is capable of killing newly hatched chickens and adult birds (not specified but presumably chickens) (Baker et al. 1956). *O. bursa* is distributed throughout warmer regions and has been reported in Florida and other eastern states (Baker et al. 1956). We attribute the failure of the above nest to heavy infestation of *O. bursa*. From time to time in southern Florida we have observed other kite nests that contained large numbers of brown and red mites. In 1969, a nest in eastern Conservation Area 2A (Broward County) of the Everglades was heavily infested with mites, and the three nestlings did not survive. We believe the death of these young was related to the mite infestation.

More parasite work is needed on the Snail Kite, particularly for endoparasites. In that snails are intermediate hosts for many parasitic organisms and Snail Kites generally feed exclusively on several species of these mollusks (in Florida usually only on *Pomacea paludosa*), their potential for parasite infection would appear to be high, especially for infection with flukes.

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Two species of mosquitoes feed on Snail Kites in Florida.—On 30 April 1969, while routinely checking the nesting progress of Snail Kites (*Rostrhamus sociabilis plumbeus*) in eastern Conservation Area 2A of the Everglades, Broward County, Florida, I discovered that at one nest mosquitoes were having a blood meal on three nestlings 12 to 14 days old. At 0810, I collected several adult female mosquitoes while they were feeding on the exposed skin near the base of the birds' bills. The sky was clear at the time. The mosquitoes were identified at the Florida Medical Entomology Laboratory at Vero Beach as *Anopheles crucians* and *A. walkerii*. No mosquitoes have previously been identified as parasites of the Snail Kite in Florida. Furthermore, these two culicids almost never feed in daylight, even when they are placed on a host on which they readily parasitize at night (H. W. Kale, II pers. comm.). A number of species of *Anopheles* mosquitoes are transmitters of avian and mammalian malaria parasites (Garnham, 1966. Malaria parasites and other Haemosporidia. Oxford, England, Blackwell Sci. Publ.; Greiner, E. C. et al. 1975. Distribution of the avian hematozoa of North America. Can. J. Zool. 53:1762-1787). Whether *R. sociabilis* is susceptible to avian malaria is not known. There are undoubtedly other species of mosquitoes in Florida that use Snail Kites as hosts, but they remain to be documented.

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