

All questionnaires completed by Forest Rangers in the western counties indicated an absence of skunks for several years. In extensive coverage of much of this back country since 1960 I have observed no sign of skunks and personal interview with residents throughout western Nova Scotia has provided only negative results. The complete lack of any positive information for several years suggests that skunks probably do not occur in western Nova Scotia now.

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## STUDIES OF THE BYRON BOG IN SOUTHWESTERN ONTARIO XXXIX. INSECTS TRAPPED IN THE LEAVES OF SUNDEW, *DROSER* *INTERMEDIA* HAYNE AND *DROSER* *ROTUNDIFOLIA* L.

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THE BYRON BOG has been described by Judd (1957). Its central part is a floating mat of *Sphagnum* moss. On this mat grows the pitcher-plant, *Sarracenia purpurea* L. A study of the insects found in the leaves of this plant was conducted in 1956 and reported on by Judd (1959). Also on the mat grow two other carnivorous plants, the Spatulate-leaved Sundew, *Drosera intermedia* Hayne and the Round-leaved Sundew, *Drosera rotundifolia* L. *D. intermedia* is more abundant than *D. rotundifolia* for it grows in extensive patches on the *Sphagnum* mat, while *D. rotundifolia* is more scattered and grows on the sides of cushions of *Sphagnum*. Charles Darwin (1898) in the opening sentence of his "Insectivorous Plants" said "During the summer of 1860 I was surprised by finding how large a number of insects were caught by the leaves of the common sun-dew (*Drosera rotundifolia*) on a heath in Sussex" and proceeded to give an account

of many subsequent original observations on the insectivorous habits of this plant. Lloyd (1942) brought together observations on the habits of *Drosera*, including several by Darwin.

On August 12, 1967 collections were made of insects trapped in the leaves of *D. intermedia* and *D. rotundifolia* in the Byron Bog. There was no wind, the temperature was 75°F, and the sky was clear except for the presence of scattered cumulus clouds. During the afternoon plants of the two species were scanned closely and any leaf on which part of the blade was rolled, or the tentacles were bent over the blade, was snipped from the plant and examined with a hand lens. Several leaves had small portions of fronds of *Sphagnum* moss trapped by the tentacles. Darwin (1898) points out that "if a bit of dry moss, peat or other rubbish, is blown onto the disc, as often happens, the tentacles clasp it in a useless manner." Fifty leaves were found clasping dead insects. These were carefully removed and pinned or preserved in fluid and were identified by the following taxonomists all of whom, except V. R. Vickery, are members of the staff of the Entomology Research Institute, Department of Agriculture, Ottawa: D. Brown (Hemiptera, Homoptera), R. deRuelle (Coleoptera), R. V. Peterson (Chloropidae, Pipunculidae, Scatopsidae), W. R. Richards (Aphidae), H. J. Teskey (Tipulidae), V. R. Vickery, Macdonald College, Quebec (Gryllidae), J. R. Vockeroth (Anthomyzidae, Muscidae). All the specimens are in the collection of the Department of Zoology, University of Western Ontario except some noted as "kept" in the Canadian National Collection. Many of the insects were too greatly dismembered to be recognized but several were identified to genus and species. As will be seen in the following account, several of them are species which have been found previously in the bog in various habitats, particularly on bushes of leather-leaf, *Chamaedaphne calyculata* and in Redmond's Pond, a permanent pond in the *Sphagnum* mat. Table I shows what insects were collected.

#### ACCOUNT OF INSECTS COLLECTED

As many as three insects were found in one leaf, as exemplified by three *Oscinella* sp. in a leaf of *D. intermedia*. Darwin (1898) records that as many as thirteen insects were found in a single leaf of *D. rotundifolia*. The presence of 47 flies in the leaves, about three-quarters of the total catch, is in accord with the observation of Darwin (1898) that "flies (Diptera) are captured much oftener than other insects." In the trapping of an insect by *D. rotundifolia* the blade of the leaf remained flat and the tentacles alone closed over the insect. In *D. intermedia* the tentacles closed over the insect and in addition, in some cases, the tip of the leaf curled downward along the length of the leaf, thus enclosing the insect in a cylindrical roll formed by the blade of the leaf. This latter observation is in accord with the report on *D. intermedia* by Darwin (1898) that the "apex of the leaf curls over an exciting object." Many more leaves of *D. intermedia* than of *D. rotundifolia* were found clasping insects, this difference being probably a reflection of the greater abundance of *D. intermedia* as compared with *D. rotundifolia*.

TABLE 1. — Insects trapped in fifty leaves of *Drosera*

Order	Family	Name	Number of leaves of <i>Drosera</i>		Number of Insects
			<i>intermedia</i>	<i>rotundifolia</i>	
Orthoptera	Gryllidae	<i>Nemobius</i> sp. (nymph)	1		1
Coleoptera	Dytiscidae	<i>Hydroporus</i> sp.	1		1
	Helodidae	<i>Cyphon</i> sp.	4		4
Hemiptera	Saldidae	<i>Saldula orbiculata</i>	1		1
		<i>Micracanthia ?humilis</i>	2		2
	Miridae	<i>Plagionathus</i> sp.	1		1
Homoptera	Cicadellidae	unidentified hopper	1		1
		<i>Macrosteles</i> sp.	1		1
		<i>Scleroracus</i> sp.	1		1
	Aphidae	<i>Rhopalosiphum maidis</i>	3		3
		<i>Aphis ?fabae</i>	1		1
Diptera	Chironomidae	unidentified midges	7	1	9
	Tipulidae	<i>Erioptera uliginosa</i>	1		1
		<i>Erioptera ?caloptera</i>	1		1
		? <i>Erioptera</i> sp.	1		1
	Mycetophilidae	<i>Macrocera</i> sp.	1		1
	Scatopsidae	<i>Scatopse fuscipes</i>		1	1
	Pipunculidae	<i>Pipunculus</i> sp.		1	1
		unidentified fly	1		1
	Chloropidae	<i>Oscinella</i> sp.	2		4
	Anthomyzidae	<i>Cyamops nebulosa</i>	1		1
	Muscidae	<i>Coenosia tigrina</i>	1		1
	Unidentified flies		14	3	25
TOTALS			47	6	64

Forty-four leaves of *D. intermedia* and six leaves of *D. rotundifolia* held a total of 64 insects. Three leaves of *D. intermedia* held two different species of insects: 1 *Rhopalosiphum maidis* and 1 chironomid fly; 1 *Cyphon* sp. and 1 unidentified fly; 1 *Oscinella* sp. and 1 chironomid fly. Thus the total of forty-seven leaves reported for *D. intermedia* in Table I represents the forty-four leaves of this species holding insects. Other insects caught in leaves of *D. intermedia* were distributed as follows: thirty-two leaves with 1 insect each; seven leaves with 2 unidentifiable flies each; one leaf with 2 chironomid flies; one leaf with 3 *Oscinella* sp. In the leaves of *D. rotundifolia* the insects were distributed as follows: five leaves with 1 insect each and one leaf with 2 unidentified flies.

ORTHOPTERA  
Gryllidae  
*Nemobius* sp. — 1 nymph. Dr. Vickery, in identifying the nymph, pointed out that it was in the first or second instar and was probably *N. palustris*, a species confined to *Sphagnum* bogs (Vickery and Kevan, 1967).

COLEOPTERA  
Dytiscidae  
*Hydroporus* sp. — 1 adult. Several species of

this genus of beetle were collected perviously from Redmond's Pond by Judd (1968).  
Helodidae  
*Cyphon* sp. — 4 adults. Several beetles of this genus were collected previously from leaves of leather-leaf by Judd (1960).

HEMIPTERA  
Saldidae  
*Saldula orbiculata* (Uhler) — 1 shore bug. Bugs of hte genus *Saldula* were found pre-

viously on Redmond's Pond (Judd, 1961). *Micracanthia ?humilis* (Say) — 2 shore bugs. Usinger (1956) reports that bugs of the genus *Micracanthia* inhabit bogs.

#### Miridae

*Plagiognathus* sp. — 1 plant bug. *P. repetitus* Knight occurred commonly on leather-leaf in 1956 (Judd, 1960).

#### HOMOPTERA

##### Cicadellidae

*Macrosteles* p. — 1 leaf hopper. Hoppers of this genus are present on leather-leaf in the bog (Judd, 1960).

*Scleroracis* sp. — 1 leaf hopper. Two species of this genus occur commonly on leather-leaf in the bog (Judd, 1960).

One unidentified leaf hopper was found in a leaf.

##### Aphidae

*Rhopalosiphum maidis* (Fitch) — 3 aphids. This is the Corn Leaf Aphid (Archibald, 1958).

*Aphis ?fabae* Scopoli — 1 aphid. *A. fabae* is reported by Archibald (1958) to winter on high bush cranberry and strawberry bush, both of which are shrubs found in the bog (Judd, 1966).

#### DIPTERA

##### Chironomidae

Nine unidentified midges were found in the leaves. Several species in this family form a large part of the population of insects in Redmond's Pond (Judd, 1961).

##### Tipulidae

*Erioptera uliginosa* Alex. — 1 crane fly (kept). This species was found previously in the bog by Judd (1960).

*Erioptera ?caloptera* Say — 1 crane fly.

*Erioptera* sp. — 1 crane fly.

##### Mycetophilidae

*Macrocera* sp. — 1 female fungus gnat. A fly of this genus was found previously in the bog by Judd (1960).

##### Scatopsidae

*Scatopse fuscipes* Meigen — 1 fly. This species is widely distributed in North America and the larvae live in decaying plant material and animal excreta (Stone *et al.*, 1965).

##### Pipunculidae

*Pipunculus* sp. — 1 fly. This fly was in a leaf of *D. rotundifolia* and another pipunculid fly of unknown genus was in a leaf of *D. intermedia*. Flies of this family are parasites of Homoptera, many species of which occur in the bog (Judd, 1960).

##### Chloropidae

*Oscinella* sp. — 4 flies (kept). One species of *Oscinella* has been found on leather-leaf in the bog (Judd, 1960).

##### Anthomyzidae

*Cyamops nebulosa* Mel. — 1 male (kept). Flies of this family are taken commonly from grass and low vegetation, especially in marshy areas (Stone *et al.*, 1965).

##### Muscidae

*Coenosia tigrina* (Fab.) — 1 female. Several species of *Coenosia* have been found in the bog (Judd, 1960), including *C. tigrina* from Redmond's Pond (Judd, 1961).

In addition to the flies identified above, twenty-five dismembered and unidentified flies were found in the leaves.

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## GREAT BLUE HERON COLONIES IN ALBERTA

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A SURVEY of nesting colonies of Great Blue Herons (*Ardea herodias*) was made in Alberta from May to August, 1967, as part of a Canadian Wildlife Service program to protect endangered birds. Most heronries were located by asking biologists, wardens, and naturalists if they knew of nesting colonies in their areas. A few others were found by searching apparently suitable habitat along rivers and around lakes. A few colonies may have been missed as the survey was not exhaustive. A heronry of 11 active nests, situated in low willow bushes on an island at Dowling Lake, was studied in 1968 because of its accessibility. This colony was visited twice or four times a week during April, twice or three times a week in May, and once a week in June and July of 1968.

Most heronries are located in the southern half of the province as shown in Figure 1. Numbers and letters in that figure correspond to the active and extinct nesting colonies shown in Tables 1 and 3 respectively. All colonies were near water, probably on account of the feeding habits of the herons. Cottam and Uhler (1945) found that 189 stomachs of Great Blue Herons collected throughout the United States contained mostly fish and aquatic arthropods. Of the 35 active and extinct colonies, 19 were located on lake islands, 4 near lake shores, and 12 near rivers or creeks. The preference for nesting in the tops of trees (Table 2) and on lake islands rather than on lake shores is probably a mechanism to avoid mammalian predation. The two heronries below 20 feet (Table 2) were located on islands. Behle (1958) found Great Blue Herons nesting on the ground and in greasewood bushes on several islands in Great Salt Lake, Utah. Lahrman (1957) observed Great Blue Herons nesting on the ground on an island in Old Wives Lake, Saskatchewan. Predation is probably minimal on island heronries.



Judd, William Wallace. 1969. "Studies of the Byron Bog in Southwestern Ontario XXXIX. Insects Trapped in the Leaves of Sundew, *Drosera intermedia* Hayne and *Drosera rotundifolia* L." *The Canadian field-naturalist* 83(3), 233–237. <https://doi.org/10.5962/p.364119>.

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