

## OBSERVATIONS ON THE BITING AND SWARMING OF SNIPE FLIES (DIPTERA: SYMPHOROMYIA) IN THE FOOTHILLS OF SOUTHERN ALBERTA<sup>1</sup>

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**INTRODUCTION.** During the summer of 1959 the authors were attacked severely by snipe flies while working in the foothills west of Claresholm, Alberta. A few specimens of the flies were first identified as *Symphoromyia hirta* Johnson (Brooks, 1959) but an expanded series was later re-appraised by Chillcott (1960) with reference to the Canadian National Collection in Ottawa. Their exact taxonomic status was found to be uncertain beyond membership in a *Symphoromyia hirta* complex, but for simplicity they will be referred to as *S. hirta* in this paper.

Reports of *S. hirta* activity on the eastern slopes of the Rocky Mountains in the United States (Knowlton and Maddock 1944, Mills 1943, and Stanford 1931) include descriptions of severe attacks on man and animals. There have been no published reports of attack by this species in Canada, but *S. atripes* Bigot has been collected on the western slopes of the Rocky Mountains in Canada (Hearle 1928), the United States (Ross 1940), and Alaska (Frohne 1959, Frohne and Williams 1951, Sailer 1951).

The only record in our laboratory contained a report of fly attack and a small number of specimens of *S. hirta* from Burmis, Alberta in 1955. However, inhabitants and tourists in the area were sufficiently familiar with the pest to warrant its consideration as a severe, if intermittent, nuisance.

**OBSERVATIONS AND DISCUSSION.** Most of the observations were conducted in 1959 and 1960 on a knoll (Fig. 1) of a wooded ridge, which ran generally in a southwesterly direction, in the Porcupine

Hills about 25 miles west of Claresholm, Alberta. The main observation site was located on the crest of the ridge and on the approaching slopes at an altitude of approximately 5,200 ft. above sea level. The vegetation consisted predominately of scrub Douglas fir, *Pseudotsuga taxifolia* Britt. var. *glauca* (Mayr.) Sudw. with occasional black spruce, *Picea mariana* (Mill.), scrub pine, *Pinus albicaulis* Engelm., aspen, *Populus tremuloides* Michx., and an undergrowth of juniper, *Juniperus scopulorum* Sarg., cow parsnip, *Heracleum lanatum* Michx., other forbs, and native grasses (Fig. 2). This ridge was utilized as a late summer range for cattle and contained numerous well-beaten trails among the trees. Observations were also taken around a parked automobile on the open range below this ridge, around herds of cattle and some horses. In addition we observed fly activity around ranch buildings 3 miles away and 1,000 feet lower; these were in a poplar-spruce grove adjacent to a small stream. Spot checks were also made along the foothills from Pincher Creek to Stavelly at sites that were similar to our main observation area.

Only the female flies bit and their attack was somewhat similar to that of deer flies (*Chrysops* spp.) in that they landed unobtrusively and inflicted bites before their presence was realized. Unlike deerflies they gathered in "following swarms" about the head and shoulders and their intense hum was characteristic of much larger insects. They also crawled under shirt cuffs and collars, and under trouser legs to bite. The disproportionately loud hum and the "crawly" feeling tended to induce panic. The flies bit as readily on the tough palm of the hand as on the

<sup>1</sup> Contribution from the Veterinary-Medical Entomology Section.



FIG. 1.—A general view of the main snipe fly observation site in the Foothills of southern Alberta

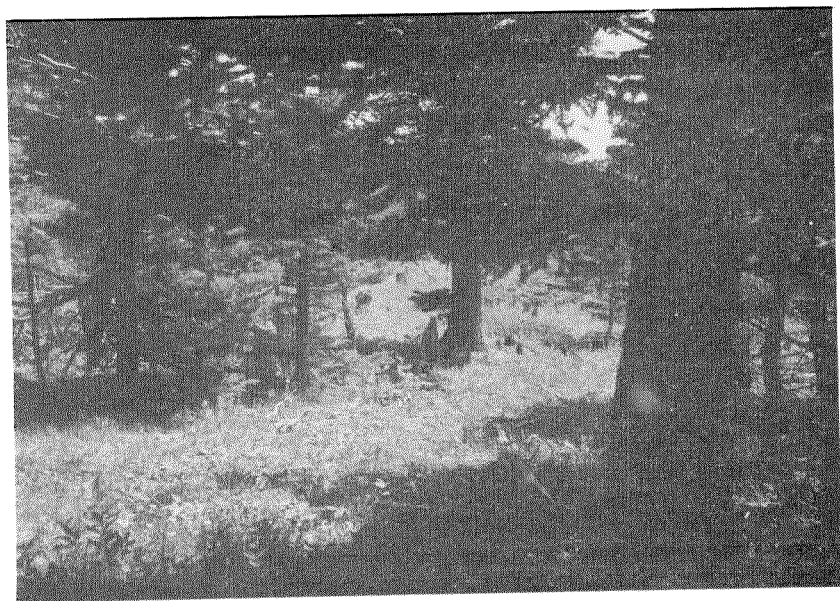


FIG. 2.—A pathway through the woods along which male swarms were found

more tender skin of the face and the back of the neck (Fig. 3).

When unmolested they probed for blood several times, each probe forming a new puncture. Blood usually oozed for a while after the probing, which may

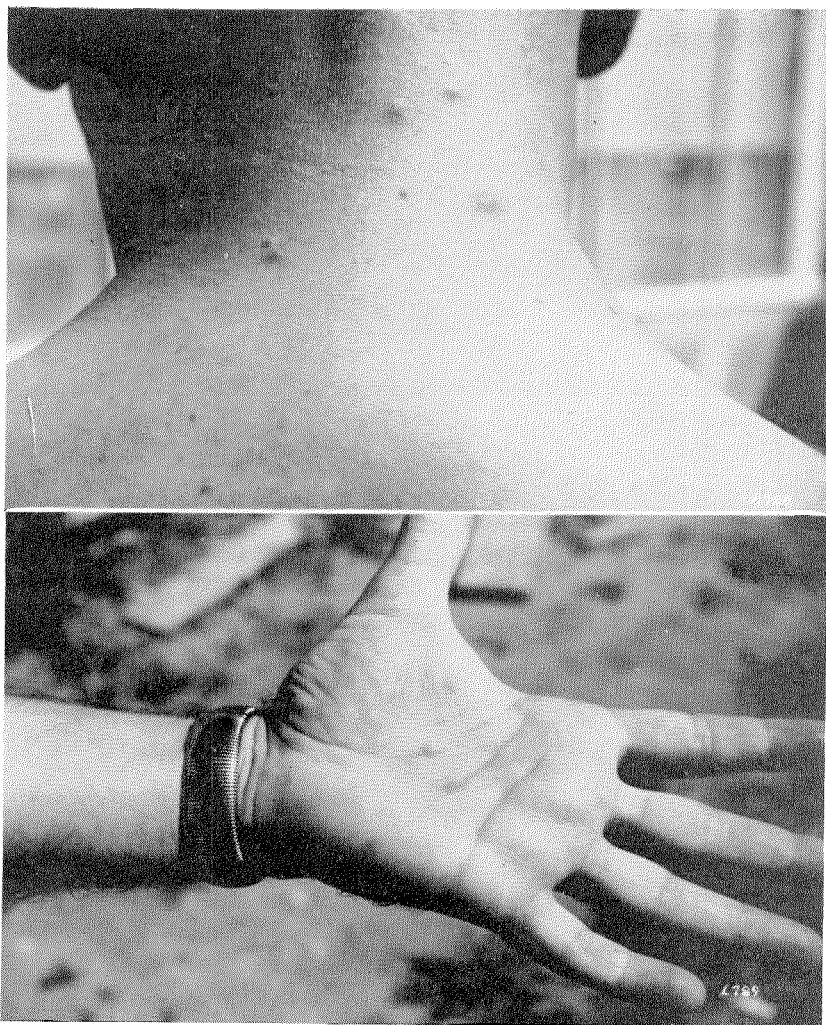


FIG. 3.—Erythematous macropapules on the back of the neck and the palm of hand three days after being bitten by snipe flies.

be due to an anticoagulant present in the salivary secretions and/or to the severe laceration from the numerous probes in the one location. The bite was keen and painful unlike the dull sting of a mosquito. An erythematous macropapular reaction set in almost immediately and persisted with accompanying irritation for 3-4 days. Victims reacted variably: of the four observers working in the same location at the same time, one reacted violently showing severe inflammation (Fig. 3), two had moderate inflammation, and one appeared to be unaffected. One of the moderately-reacting observers was the most panic-stricken. He draped an insect net over his head, slapped frantically at the assembled flies, and finally had to leave the observation area.

In 1959, relief from the flies could be obtained by leaving the brush and going to the open prairie. Conversely, a person was not bothered until he approached within a few hundred feet of trees and shrubs. The numbers of flies that were attracted increased as one went deeper into the brush, but did not decrease appreciably in the small openings among the trees. However, in 1960 the flies attacked the observers and ranchers in hay fields about 5 miles away from the wooded areas. Large numbers of the flies followed a farmer operating a tractor in an open hay field, and another man who was engaged in haying was so affected by their bites as to be bedridden for a few days. The flies were attracted to a light green car parked on the open prairie downhill from observation site in moderate numbers in 1959, and in much greater numbers in 1960.

Livestock generally did not seem to attract large numbers of the flies but some yearling and calf steers were bothered by an average of about 15-30 flies. One tethered calf in the brush was observed closely and the flies congregated mainly about the head and to a lesser degree about a raw brand from which they were sucking oozing blood. These cattle were either on the lee side of a brushy area or in the brush itself.

Another herd of yearling cattle, in the open and subject to high winds, were completely devoid of snipe flies, though attacked by horse flies, deer flies and horn flies. Three horses, examined in the direct sunlight in 1959 and in the shade in 1960, attracted no snipe flies. Both times, however, they were on the windward side of buildings. Hearle (1938) reported that *Symphoromyia* spp. attacked pack horses and sheep in the higher plains of British Columbia.

The seasonal distribution of the flies began in late June, reached a peak about mid-July and declined by mid-August. The greatest concentrations of flies seemed to be in poplar and conifer stands in the foothills observation station, but they were also plentiful around the ranch buildings and surrounding trees. It was first thought that the population in the wooded areas was somewhat different in behaviour from the population in the open areas. Although both were persistent in their attack, the population from the wooded areas followed observers out into the open for only a few yards and ceased to be a nuisance, whereas the population on the open prairie pursued the observer into the shaded or wooded area. These differences seemed to be based on wind intensity, because the flies that attacked in the open did so when the wind speed was less than 500 ft./min.

Residents of the Claresholm district stated that this pest had not been as serious as in 1959 and 1960 for a considerable time. Residents of the foothills recalled that previous serious outbreaks occurred in 1948 and 1954. These flies were given such names as "Sleepy flies" and "Lazy flies" but were sometimes confused with blackflies, stable flies, horn flies and house flies. Additional observations and reports from as far south as Waterton Lakes and as far north as Valley View indicated that the outbreak was not localized. *S. hirta* has been also reported as seriously annoying man and cattle in Utah for the years 1958 and 1960 (U.S.D.A. 1958, 1960).

Males of this species were plentiful at

the main observation site, but they exhibited no interest in human beings and appeared to be confined to typical male swarms. Large swarms up to a length of 100 yards formed along certain pathways (Fig. 2) through the trees and in aggregation resembled "marker swarms" as described for mosquitoes by Nielsen and Haeger (1960). However, the flight of individuals was noticeably more erratic than the flight formations taken up by swarming male mosquitoes and chironomids.

Females were abundant in the vicinity of these male swarms and entered the swarms in a ratio of 1 female to 5 males, a higher ratio than that observed for mosquitoes. These swarming sites were the only occasions when both sexes were caught together. It is possible that they represented mating swarms, even though actual copulation was not observed. The swarms first formed at about 7:30 a.m. and continued until late afternoon depending on the weather conditions. Orientation of the males appeared to be predominantly into a slight wind and at right angles to the sun. Swarms moved higher as the time of day progressed, probably in response to the increasing height of the sun's rays through the trees. On sunny days swarming was vigorous and could be detected by a characteristic hum, but activity was reduced when clouds obscured the sun even momentarily. No swarms were observed on cloudy cool days. Sweeping through the swarm with an insect net dispersed the insects and it took one or two minutes for them to regroup. This is the first known report of male swarming for *S. hirta*. A previous report of vertical swarms above water hydrants (Knowlton and Maddock 1944) did not identify the sex of the swarming flies, but the context of the report suggested that they were females.

Nothing is known of the breeding places and the life history of the species. The abundance of adults would indicate that larvae and pupae should be present in the vicinity of the foothills. In the early spring of 1960 a search for larvae

and pupae was made in rotting sawdust and decaying organic matter along streams and in soil around permanent sloughs in the vicinity of the observation sites, but none were found.

Snipe flies are of potential nuisance value to the increasing number of tourists that frequent the area as well as to the resident farmers and lumbermen. Apart from the nuisance value, their persistent attack, along with the many probes made in the process of obtaining a blood meal, might make them a possible mechanical vector of disease. The labella are similar to those of *S. atripes* as described by Ross (1940), being large and possessing well-developed pseudotracheal system and numerous bristles. This feature might enhance its potential as a disease vector.

Control of this pest will be difficult until more knowledge is obtained on the life-history and habits. Without this information the use of repellents would seem to be the best way to protect humans. Rutgers' "612" was tried but it proved ineffective against these flies. No organized attempt has been made to protect livestock against snipe flies in the field. Pyrethone sprays were unsuccessful in reducing the number of flies annoying a pet baby calf on the ranch near the observation station.

**SUMMARY.** *Symphoromyia hirta* was found to be a serious pest of humans in the foothills of Alberta during the summers of 1959 and 1960. The females inflicted bites on exposed parts of the body. The bites were very painful and produced an almost immediate erythematous macropapular reaction, which persisted with accompanying irritation for about three to four days. Males did not attempt to bite. Livestock were attacked in moderate numbers.

The flies were most abundant in the wooded areas at an elevation of approximately 5,200 feet, but females were also found around farmsteads and open pastures at lower elevations of approximately 4,200 feet. Male swarms, which are believed to be mating swarms, formed up

along certain pathways in the brush at about 7:30 a.m. and were present until early afternoon, with a gradual movement upward as the time of day progressed. The males in the swarm were orientated into a slight wind and at right angles to the sun. The ratio of the sexes in the swarms was 1 female to 5 males. Overcast skies inhibited this swarming activity. Strong winds prevented activity of both males and females.

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#### References

- BROOKS, A. R. 1959. Research Station, Research Branch, Canada Department of Agriculture, Saskatoon, Saskatchewan. Personal communication.
- CHILLCOTT, J. G. 1960. Entomology Research Institute, Research Branch, Canada Department of Agriculture, Ottawa, Ontario. Personal communication.
- FROHNE, W. C. 1959. Observations on Alaskan snipefly pests (Symphoromyia: Rhagionidae). *Mosquito News* 19(3):172-178.
- FROHNE, W. C. and WILLIAMS, R. B. 1951. Notes on snipe flies on the genus *Symphoromyia* in Alaska. *Mosquito News* 11(1):32-33.
- HEARLE, E. 1928. Insects of the season 1928 in British Columbia. Insects affecting livestock and man. 59th Annual Rept. Entomol. Soc. Ont. 35 pp.
- KNOWLTON, G. F. and MADDOCK, D. R. 1944. Snipe flies in Utah. *J. Econ. Entomol.* 37:119.
- MILLS, H. B. 1943. An outbreak of the snipe fly *Symphoromyia hirta*. *J. Econ. Entomol.* 36: 806.
- NIELSEN, E. T. and HAEGER, J. S. 1960. Swarming and mating in mosquitoes. *Misc. Pubs. Entomol. Soc. Am.* 1(3):71-95.
- ROSS, H. H. 1940. The Rocky Mountain "Black fly" *Symphoromyia atripes* (Diptera: Rhagionidae). *Ann. Entomol. Soc. Am.* 33:254-257.
- SAILER, R. I. 1951. The biting snipe fly in Alaska. *Proc. Entomol. Soc. Wash.* 53(6):331-332.
- STANFORD, J. S. 1931. Notes on Diptera attacking in Sevier County, Utah. *Pan-Pacific Entomologist* 7:99-100.
- U.S.D.A. 1958. Summary of insect conditions in the United States 1958. Insects attacking livestock. *Coop. Econ. Insect Rpts.* 8(46):948.
- . 1960. Summary of insect conditions in the United States 1959. Insects attacking livestock. *Coop. Econ. Insect Rpts.* 10(8):105.

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WITH APOLOGIES: The photographs on page 146 of our June number (Vol. 21, No. 2) were taken by Tommy Mulhern. This credit line should have appeared with the photographs.