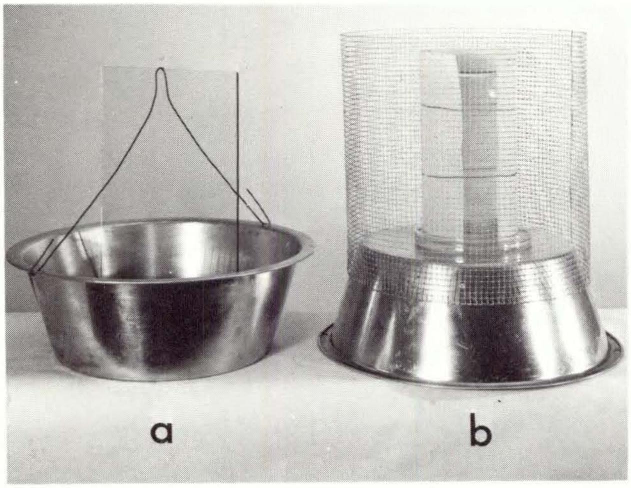

FIGURE 1. Flight traps: a) glass barrier type; b) sticky screen type.

A new flight trap was also used. It consisted of an inverted 64 oz large-mouth jar supported by a ¼-inch mesh wire collar ⅜ inches above the bottom of a petri dish (Fig. 1b). Two paper towels (high wet strength, fast flow rate) wrapped around the jar served as a wick. The jar was surrounded by a ¼-inch mesh wire cylinder dipped in melted 'Stikem Special' (Michel and Pelton Co., Oakland, Calif.). These nondirectional traps operated unattended for a week or more, depending on rate of evaporation as affected by weather. Trapped insects were washed off the wire screen with benzene. Six pairs of these traps were placed at the same locations as the barrier traps between May 12 and 22, one pair-member containing 10% ethanol, the other water. They appeared to be much more effective than the pan-type traps.

The numbers of insects caught in the traps are listed in Table 1. *Trypodendron*, *G. sulcatus*, *Anisandrus* and *Xyleborus* were clearly attracted by ethanol, as was *Rhizophagus dimidiatus*. Analysis of the data for *Trypodendron* (Table 2), with the Wilkoxon matched-pairs signed-ranks test (Siegel, Nonparametric

TABLE 1
Field test of ethanol as an attractant

Insect		No. of insects: water (26 traps)	No. of insects: 10% ethanol (26 traps)
Trypodendron lineatum (Olivier)	♂	6	22
	♀	17	55
Gnathotrichus sulcatus Lec.	♂	7	282
	♀	9	58
Anisandrus pyri Peck.	♀	142	3457
Xyleborus saxeseni Ratz.		6	102
Other Scolytidae		50	70
Rhizophagus dimidiatus Mann.		12	126
Cerambycidae		0	12
Other Coleoptera		1202	2251

TABLE 2
Numbers of *T. lineatum* caught in control and test traps

Group No.	Trap Type	No. of beetles: water ♂	water ♀	10% ethanol ♂	10% ethanol ♀
1	Glass barrier	0	1	0	1
2	"	0	0	1	1
3	"	0	0	0	4
4	"	0	0	1	2
5	"	0	0	3	13
6	"	1	7	4	13
7	"	1	2	1	4
8	"	1	1	0	1
9	"	1	0	0	1
10	"	0	0	2	1
11	Sticky screen	0	0	1	0
12	"	0	0	1	1
13	"	1	0	1	1
14	"	0	0	1	1
15	"	0	0	0	0
16	"	1	6	6	11
Totals		6	17	22	55

Statistics, McGraw-Hill Co., 1956), indicated significant differences between control and test trap catches for males and females at P=0.025 and 0.005 levels, respectively. Fewer *Trypodendron* were caught than expected, judging by the large number of beetles flying in the area. Several explanations are possible: a) ethanol *per se* may be a weak attractant; b) the ethanol concentration used may not have been the optimum for this insect; c) other chemical or visual factors may play a role in primary attraction; d) only a fraction of the population may be responsive to ethanol, the remainder using the secondary attractant as the main cue, or e) the behavior of the local population may have been dominated by stronger natural attractant sources in the vicinity.

The large number of *Anisandrus* females captured (males are flightless) was unexpected. This ambrosia beetle attacks a variety of hardwoods, and at times is a pest in fruit orchards (Mathers, Can. Entomol. 72: 189-190, 1940; Jack, B.C. Dept. Agr. Rep., 1965). Trapping with ethanol may be useful in the study or control of this insect.

The attraction of *Rhizophagus* by ethanol is interesting. Although the biology of the western North American species is virtually unknown, Escherich (Die Forstinsekten Mitteleuropas Vol. II, 1923) states that adults and larvae of various *Rhizophagus* species prey on the brood of bark and ambrosia beetles. If *R. dimidiatus* is predaceous on Scolytidae, attraction by ethanol (i.e., log odor) would help in locating prey. Henry Moeck, Forest Research Laboratory, Victoria, B.C.

Mortality of Monochamus Larvae in Slash Fires.—The use of prescribed fire as a management tool is increasing and it is of value to know the effect of these fires on wood borer populations in slash. In 1969, experimental fires in slash of lodgepole pine [*Pinus contorta* Dougl. var. *latifolia* Engelm.] at the Kananaskis Experimental Forest, Alberta, (Quintilio, Intern. Rep. A-30. May 1970) provided an opportunity to study the effect of fire on the survival of larvae of the genus *Monochamus*. The experimental plots varied in total fuel loading from 30 to 50 tons per acre, slash was 4 inches and over in diameter, and plots were burned under various hazard ratings. Adjacent 1-acre plots had been cut in the spring of 1968 and were burned in the summer of 1969.

Monochamus adults laid eggs into the logs in 1968, and by 1969 all larvae had tunnelled into the wood. After each plot had been burned, the author chose logs for sampling by walking in straight lines through the plot and sampling the first 10 infested logs. Logs within 10 ft of plot boundaries were not sampled to avoid any edge effects. A sample consisted of one larval entrance hole or more on each log. These were cut open and the larvae were recorded as alive or dead. Larvae previously killed by diseases, as evidenced by their dark brown coloration and shrivelled body, were not included. These were separated from fire-killed larvae which were yellow-brown and brittle.

All *Monochamus* larvae were killed by extreme- and high-rated slash fires; moderate-rated slash fires killed most of the larvae, and low-rated slash fires killed only a few larvae (Table 1).

TABLE 1
Mortality of *Monochamus* larvae in slash fires

Hazard rating of slash fire	Avg fire intensity (BTU/sec per 2 feet)	Slash consumption (>4 inches) (%)	No. of logs sampled	No. of larvae: Live	No. of larvae: Dead	No. of larvae: Total	Larval mortality (%)
Low	358	10	20	25	5	30	16.7
Moderate	1,708	31	20	3	20	23	86.9
High	5,791	42	30	0	39	39	100.0
Extreme	12,544	60	30	0	38	38	100.0
Total	—	—	100	28	102	130	—

The data from logs in the plots with low and moderate hazard ratings were grouped according to several heights of logs above ground and analysed for borer mortality. No clear relation was indicated except for reduced mortality of borers in logs at ground level.—B.M. Dahl, Forest Research Laboratory, Edmonton, Alta.

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RESEARCH NOTES

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