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(Dyer and Taylor, Can. Entomol. 100:769-776, 1968). A field test was designed to determine whether spruce beetles could orient by means of olfaction to uninfested cut host material.

The study was conducted in 1975, near Prince George, B.C., in the Naver Forest. Two sites for trap placement were chosen: A) a closed stand of old growth spruce (*Picea engelmannii* Parry, *P. glauca* [Moench] Voss) mixed with subalpine fir (*Abies* lasiocarpa [Hook.] Nutt.), and B) a landing at the edge of a large clearcut area slash-burned in 1974 and flanked by a severely wind- and fire-damaged stand edge of a species composition similar to A (above). Both sites had large numbers of emerging spruce beetles.

Twenty "greenhouse" cages (Chapman, Can. Entomol. 98:50-59, 1966) 76 x 76 x 72 cm high were used in control-test pairs, five pairs at each site. The control cages were empty, whereas the test cages contained four or five bolts, approximately 68 cm long, cut from freshly felled white spruce. Two window flight traps were placed at right angles to each other on top of each cage. Members of a cage pair were placed 10 to 15 m apart, whereas cage pairs were separated by at least 15 m. Trapped beetles were collected at 3- to 7-day intervals, eight times in area A and seven times in area B, from May 29 and June 2, respectively, to July 3. After trapping ended, all test bolts were stripped of bark and checked for possible insect attacks.

TABLE 1

Trap catches of *Dendroctonus rufipennis* (Kirby) at empty control cages and test cages containing spruce bolts, Naver Forest, 1975

Test area	Trapping days	Numbers of *D. rufipennis* caught					
		Control cages (empty)			Test cages (bolts)		
		♂	♀	♂+♀	♂	♀	♂+♀
A	35	0	0	0	4	5	9
		1	3	4	7	7	14
		0	0	0	5	5	10
		0	0	0	3	3	6
		0	0	0	7	7	14
B	31	0	0	0	2	6	8
		0	0	0	3	5	8
		0	1	1	1	3	4
Totals		1	4	5	32	41	73

Total catches of *D. rufipennis* by sex for each control-test cage pair are given in Table 1 (two cage pairs in area B were eliminated from the analysis because log dissection revealed that spruce beetles had gained access to the logs and produced galleries and presumably pheromones, as evidenced by increased numbers of beetles caught — 102 beetles on two cages in the same time period). Catches of males, females, and both sexes together on the test cages were significantly higher than on controls at $p = 0.005$ (Wilcoxon matched-pairs signed-ranks test, one-tailed: Siegel, Non-Parametric Statistics, McGraw-Hill Co., 1956), indicating that spruce beetles are capable of orienting to sources of odors from cut host material in the absence of normal visual cues.

The sex ratio of trapped beetles favors males slightly (43.8% males) over that found in emerging beetles (41.2% males) (L. Safranyik, Pacific Forest Research Centre, pers. comm.). The response of male spruce beetles to host odors is interesting, since the males do not initiate gallery construction. A similar phenomenon has been reported for other Scolytid species, for example *Trypodendron lineatum* (Oliver) and *Gnathotrichus sulcatus* LeC. (females in the latter species) (Moeck, Bi-mom. Res. Notes 27:11-12, 1971), and *Hylastes nigrinus* (Mann.) (Rudinsky and Zethner-Møller, Can. Entomol. 99:911-916, 1967). The simultaneous arrival of both sexes on suitable host material would facilitate mate-finding and gallery establishment.

Gara and Holsten (Z. Angew. Entomol. 78:248-254, 1975) stated that uninfested spruce bolts were unattractive to Scolytidae encountered in Alaska, including the spruce beetle. The difference in results may be due to differences in methodologies as well as study areas; the level of primary attractiveness of spruce bolts is low (average 0.27 beetle/cage per day), so that sensitive methods of detection must be used. — H.A. Moeck, Pacific Forest Research Centre, Victoria, B.C.

Field Test for Primary Attraction of the Spruce Beetle. — The spruce beetle (*Dendroctonus rufipennis* [Kirby]) (Coleoptera: Scolytidae) infests several species of spruce across North America. Under endemic conditions, the beetles breed in wind-thrown, cut and severely damaged or diseased trees and stumps; apparently healthy standing trees are seldom attacked. Under epidemic conditions, however, standing trees, as well as down host material, are infested. The host selection behavior of the spruce beetle has not been investigated by methods that take into account the secondary attraction (pheromones) produced by virgin female beetles

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