2—The proboscis is formidable, the stylets stout, and both mandibles and maxillae are denticulate. In the normal male, the proboscis with its stylets is more delicate, and in this species no true teeth are recognizable.

3—The shape of the segments of both palpi, which in the male, is more slender. In the normal male of this species, the third segment is not enlarged.

4—Both antennae are not plumose. Furthermore, the shape of the segments is like that of the female; the pedicel is not as large as that of the male, and each one of the last five segments is distinctly elongated. In the (normal) male of this species, the pedicel is very large, the third through the twelfth segments bear verticils; the thirteenth through the fifteenth segments are the only segments which are excessively elongated and narrow.

These two gynandromorphs are deposited in the U. S. National Museum.

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ADDITIONAL NEW RECORDS OF TREEHOLE *Culicoides* (DIPTERA: CERATOPOGONIDAE) IN NORTHERN FLORIDA

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Three additional species of *Culicoides* not previously reported from Florida have been recovered from treeholes in Alachua County, Florida since *C. paraensis* (Goeldi) (1965) was reported. These species are *C. debilipalpis* Lutz, *C. hinmani* Khalaf, and *C. snowi* Wirth and Jones.

The four females of *C. debilipalpis* reported were recovered from debris samples taken from a laurel (*Quercus laurifolia* Michx.) oak stump hole, laurel oak treehole, a live oak (*Q. virginiana* Mill.) treehole, and a cavity in a magnolia (*M. grandiflora* L.) tree in the San Felasco Hammock about five miles northwest of Gainesville, Florida. They emerged as adults during February, March and April, 1965 from the samples taken in October and December, 1964. Many additional specimens apparently of this species have been taken in light traps and in treehole samples from several other locations in Alachua County during each month of this year to date (September, 1965). It is believed that adults are present most of the year in this region.

One male and three females of *C. hinmani* were recovered from debris taken from the base of a 4-foot vertical slit in a magnolia tree in San Felasco Hammock. The sample was collected on December 2, 1964 and adults were obtained during March, 1965.

Three males and six females of *C. snowi* were obtained from treehole debris samples collected during October, 1964 and February and March, 1965. The males emerged in early March while the females were recovered in late March and early April, 1965. The males came only from the later samples while the females were from the samples collected in October, 1964. As no specimens have been obtained since April in light traps or treehole samples, it appears that this species may be present only during the spring.

Treehole samples were held in the laboratory in pint glass jars with organdy-screened tops at 72° ±2° F. They were inspected at weekly intervals for the presence of adults and tap water was added to cover the debris shallowly at the time of inspection.

Identifications were made by Dr. Willis W. Wirth, U. S. National Museum, and Dr. F. S. Blanton, University of Florida.

These findings resulted from studies of the bionomics of inland species of *Culicoides* supported in part by NIH Grant GM 12322–01.

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A SIMPLE APPARATUS FOR OBTAINING EMERGENCE OF LARGE NUMBERS OF *Simulium* ADULTS FROM NON-IMMERSED PUPAE

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Rearing of adult *Simulium* from pupae on vegetation collected in the field has been carried out in several ways by different investigators, without using an aquarium. To match an emerged adult with its pupa, the latter is usually placed individually in a small vial or tube with one or two moistened absorbent cotton plugs, and with or without moist blotting paper (Dalmat, 1955; Hartley, 1955). For mass rearing, Meeser (1942) removed pupae in their cocoons with a scalpel, and placed them on damp blotting paper wrapped around the inside of a wide-mouthed or rectangular museum jar, which was then covered with mosquito netting of fine mesh. Lewis (1953, 1957) placed the vegetation to which the pupae were attached in a tube or jar covered with muslin.

In an airconditioned room or in a dry atmosphere, it was found that the pupae dried out rapidly when the methods of Meeser and Lewis were followed, and that there was a limited amount of emergence which occurred during mass rearing. A means was sought, therefore, of obtaining large numbers of flies under conditions in which rapid desiccation of vegetation and pupae would not occur.

It was found that large numbers of *Simulium* adults could be obtained over a short period of time by the use of very simple apparatus consisting of a clear, glass funnel taped on to a cylindrical receptacle of the same diameter as the funnel. The one used here was 6 inches in diameter, the stem being 5½ inches long and ½ inch in diameter.

In the present instance pupae of *Simulium damnosum* Theobald and *S. adersi* Pomeroy were reared to adults. The cylindrical receptacle may be a cracker tin, large can, glass jar, plastic jar, or battery jar. A thick layer of water-soaked absorbent cotton is placed at the bottom of the receptacle and covered with a tight-fitting layer of blotting paper. The vegetation with the pupae attached is then placed into the receptacle, and liberally sprinkled with water. The inside of the jar may be lined with blotting paper or paper towels if desired, for distribution of moisture. The funnel is inverted over the opening of the receptacle, and is taped to the latter using masking or adhesive tape. The stem of the funnel is therefore vertical, with the outer opening of the stem uppermost and uncovered. The whole apparatus is then placed *horizontally* into a large cage made of netting, with the open end of the stem facing the window. If a large enough cage is not on hand, a smaller cage with a long sleeve is an adequate substitute, the sleeve being tied around the receptacle. Regular mosquito netting has too large a mesh generally, so a more closely-woven mesh should be used. Emergence in large numbers takes place without mortality, usually beginning within a few hours if the pupae are mature enough. The flies, attracted by the light coming from the window, walk from the receptacle across the inside of the funnel, into the stem, and out into the cage. As they exit from the stem they may also be isolated as desired into individual vials or tubes.

The apparatus should not be kept vertical, since the flies have difficulty in making their way up the stem. If it appears that the vegetation is drying out, water should again be sprinkled into the receptacle. This can be done easily through narrow tubing which is passed through the stem of the funnel and down into the receptacle. In a dry atmosphere the emerged flies should be removed from the holding cage within 24 hours, but if the cage cannot be attended to for several days, wrapping several layers of wet towels around it will help in keeping the flies alive, since they need a very moist atmosphere for survival under laboratory conditions.

This simple apparatus proved to be more successful than any others used because the funnel helps to retain the moisture within the receptacle, yet the open stem permits enough air to enter. Although a considerable amount of water condenses on the flared, inner surface of the funnel and coats it, the flies have no difficulty in walking upon the wet surface toward the stem. Condensation occurs only at the base of the stem, most of its length remaining dry.

To prevent ants from entering the cage and eating the flies, the holding cage containing the rearing apparatus was placed on a large square of wood supported at each corner by a 4-inch nail driven into the wood. Each "leg" thus formed was placed in a receptacle containing kerosene arranged so that the leg did not touch the side of the receptacle. Plastic Petri dishes should not be used, since they are dissolved by kerosene.

While awaiting transference to other holding cages the flies can be fed by placing blocks of lump sugar at the bottom of the emergence cage. They feed readily on the solid sugar.

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A SELF-STRAINING LARVAL CONCENTRATOR

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Collection of mosquito larvae is often very time-consuming using the dipper and screw-top jar technique because of the inefficiency of manually removing the lid to add more material, and periodically replacing the lid to strain out excess water. Earlier designs for concentrators have been expensive and sophisticated (Earle, 1956) as well as simple and easy to construct (Womeldorf, *et al.*, 1963). Both called for metal construction. These devices work well for general collecting, but because of weight were intended to be placed on the ground when in use. Since it is often either impossible or inconvenient to find a suitable location on which to place the device near the collecting site, a hand-held collector utilizing certain features of the above devices, as well as new ideas and the use of new materials,