

## ASPIRATOR GUN – A NEW DEVICE FOR SAMPLING SPIDERS AND INSECTS

FERENC TÓTH

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Using an aspirator is one of the most gentle and sometimes the only effective method of sampling, collecting or moving fragile and fast arthropods. An ideal aspirator must fulfil the following requirements:

- safe for the operator's health
- effective (low risk of escape)
- easy to use
- independent of external energy sources (no battery or compressed air).

There are two basic designs of aspirators (Table 1): the direct type (Fig. 1A), where the operator sucks air from the collecting chamber, and the indirect type (Fig. 1C), where the operator blows air into the chamber (SOUTHWOOD, 1978). Due to their great effectiveness and very simple construction, direct aspirators are much more popular than indirect ones. Some spiders spin their webs immediately in a dry aspirator, so arachnologists usually prefer a modified direct aspirator containing alcohol (Fig. 1B). Of course it cannot be used for live collecting. Because working with a simple direct aspirator – “the pooter” – presents a potential health hazard (inhaling dust, arthropod hair, pollen, spores, etc), the use of a suction bulb is advisable (MCEWEN, 1997). Nevertheless, “bulb-aspirators” are scarcely used. The one-handed bulb-aspirator (Fig. 1D) does not permit accurate aiming, because the tip of the catching tube moves when the bulb is released. The two-handed version (Fig. 1E) requires both hands during the collecting process. The new aspirator device (Fig. 1F, patented by TÓTH (1999)) is operated with only one hand and, similarly to the traditional types, it consists of a catching tube, a collecting chamber and a suction bulb; but to increase its aiming precision a winding and triggering mechanism has been added.

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T a b l e 1. Advantages and disadvantages of different aspirator types (personal experience).

	<b>Advantages</b>	<b>Disadvantages</b>
Simple direct aspirator	<ul style="list-style-type: none"> <li>– high aiming accuracy</li> <li>– continuously regulated airflow</li> <li>– one-handed</li> <li>– can be very small</li> <li>– easy to make</li> </ul>	<ul style="list-style-type: none"> <li>– health hazard (dust, arthropod hair, pollen, spores, etc.)</li> <li>– unpleasant to use for a long time (headache, discomfort)</li> </ul>
Indirect aspirator	<ul style="list-style-type: none"> <li>– no health hazard</li> <li>– high aiming accuracy</li> <li>– continuously regulated airflow</li> <li>– one-handed</li> <li>– small</li> </ul>	<ul style="list-style-type: none"> <li>– low efficiency (strong blow→weak suction)</li> <li>– unpleasant to use for a long time (headache, discomfort)</li> <li>– difficult to make</li> </ul>
One-handed bulb-aspirator	<ul style="list-style-type: none"> <li>– no health hazard</li> <li>– rather small</li> <li>– easy to make</li> </ul>	<ul style="list-style-type: none"> <li>– low aiming accuracy</li> <li>– short airflow only</li> </ul>
Two-handed bulb-aspirator	<ul style="list-style-type: none"> <li>– no health hazard</li> <li>– high aiming accuracy</li> <li>– rather small</li> <li>– easy to make</li> </ul>	<ul style="list-style-type: none"> <li>– short airflow only</li> <li>– requires both hands</li> </ul>
Aspirator gun	<ul style="list-style-type: none"> <li>– no health hazard</li> <li>– high aiming accuracy</li> <li>– one-handed</li> </ul>	<ul style="list-style-type: none"> <li>– short airflow only</li> <li>– difficult to make</li> <li>– rather large</li> </ul>

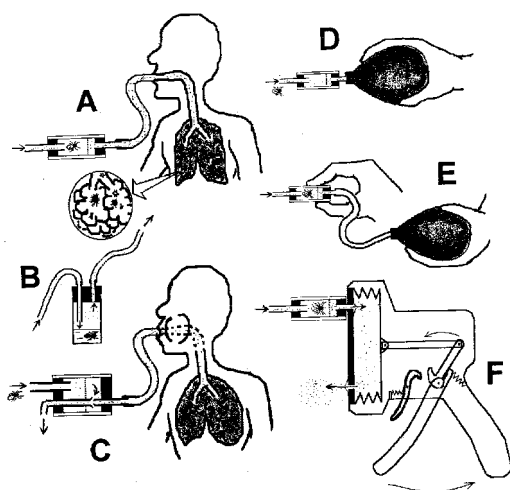


Fig. 1. Aspirator types and the way they work. A: simple direct aspirator; B: aspirator containing alcohol; C: indirect aspirator; D: one-handed bulb-aspirator; E: two-handed bulb-aspirator; F: aspirator gun. Vacuum is produced by sucking the air from the tube (A-B); blowing the air into the tube (C); releasing the compressed ball (D-E); triggering the winding device (F). A spider symbol inside the collecting chamber indicates a higher efficiency.

#### References

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