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EFFECTS OF PHYSOSTIGMINE ON SPIDER'S WEB BUILDING BEHAVIOR AND
THREAD PRODUCTION. Peter N. Witt. State Univ. of N. Y.,
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It has been previously reported (Fed. Proc. 21:No. 2, 1962) that 1 or 2 mg/kg of atropine sulfate caused spiders to build regular webs with less thread, while 4 mg/kg reduced pulled thread material by 58%. If spinning glands possess a cholinergic regulatory mechanism, a cholinergic drug should increase thread material. Two groups totalling 23 spiders received 1 mg/kg physostigmine sulfate by mouth in sugar water on 2 different days while 23 control animals received sugar water alone. The web digests contained an average of 39.1 μ g nitrogen per web on the control days preceding drug application 36.9 ± 3.8 γ N/web 12 hours after the drug had been given, 48.9 ± 4.4 γ N/web 36 hours later, and 34.5 γ N/web 60 hours after physostigmine. The increase in material used for web-building 36 hours after physostigmine was significant at the 0.1% probability level while controls did not change. One day later webs were back to control values. Web photographs of another group of spiders treated with physostigmine showed that the 36 hour webs were larger (increased catching area) and were built with an average of 1.82 m more thread per web. Experiments are under way to locate a possible cholinergic mechanism which probably regulates spiders' spinning gland activity. Supported by USPHS B-1794-06.