

Table 20.1.

THE GIANT FIBER SYSTEM. Its afferent and efferent connections in the dragonfly nymph, cockroach, and locust (adapted from Fielden, 1960).

| | <i>Anax</i> nymph | <i>Periplaneta</i> | <i>Locusta</i> |
|-----------------------------|--------------------------------|--|--------------------------|
| Giant fiber | | | |
| (a) Diameter | 12–16 μ | 20–45 μ | 8–15 μ |
| (b) Number | 6–7 | 6–8 | 4 |
| (c) Velocity | 3.5–4.5 m/sec | 6–7 m/sec | 3–4 m/sec |
| Sensory input | Sensory axons from paraprocts | Each synapse with several sensory axons from cerci | Sensory axons from cerci |
| Sensory-giant fiber synapse | | | |
| (a) Delay | 2.0–4.5 msec | 1.4–1.9 msec | 2–3 msec |
| (b) Transmission frequency | 50–60 per second | 70–100 per second | 70–80 per second |
| (c) Facilitation | No | No | ? |
| (d) Temporal summation | No | When fatigued | ? |
| Giant fiber-motor synapse | Only above 20–30 per second | | |
| (a) Delay | Long, variable | 30–50 msec; shortens following rest | ? |
| (b) Transmission properties | Labile; summation important | Labile; summation important | ? |
| (c) Influenced from head | ? | Brain stimulation can inhibit | ? |

