

Table 3.4. VELOCITY OF CONDUCTION OF NERVE IMPULSES IN SELECTED CASES. (Additional values may be found in the respective systematic chapters. See also Schaefer, 1940; *Handbook of Biological Data*, 1956.)

	Animal	Nerve Fiber	Velocity ¹ (m/sec)	Diameter incl. Sheath μ	Temp. (°C)	v/d ¹
	A	B	C	D	E	F
VERTEBRATES						
1	<i>Felis</i>	Pyramidal tract (max)	164	12.5	37	13
2		Dorsal spinocerebellar tract (max)	120	16-18		7
3		Dorsal columns, spinal cord (max)	67	10-14		5.5
4		A fibers ² in peripheral nerves	110	20		5.5
5			80	15		5.3
6			50	10		5
7			70-81	13-15	35	5.3
8			60	7-9		7.5
9			40	8		5
10			30	6		5
11			20	4		5
12			10	2		5
13		C fibers ² , sympathetic	1-2	<1-5		<1
14	<i>Rana</i>	A fibers ² , sciatic	40	20	24	2
15			30	15		
16			25	12		
17			20	10		
18			15	8		
19			10	5		
20			7	4		
21		C fibers ²	0.2-0.6	<1		
22	<i>Ameiurus</i> (catfish)	Giant fiber (Mauthner's)	50-60	22-43	10-15	appr. 2
23	<i>Cyprinus</i>	Giant fiber (Mauthner's)	55-63	55-65	20-25	1.0
24	<i>Protopterus</i> (lungfish)	Giant fiber (Mauthner's)	19	45	20	0.42
25	<i>Raja</i>	Dorsal roots	8-36	2-17		appr. 3
26	<i>Entosphenus</i> (lamprey)	Giant fiber (Müller's)	5	50	20	0.1
INVERTEBRATES						
Arthropoda						
27	<i>Carcinus</i>	Leg	4.4(3.9-5.5)	30	21	0.14
28	<i>Munida</i>	Leg	6.4	50	17	0.13
29	<i>Cambarus</i>	Lateral giant fibers	10-15	70-150	20	appr. 0.12
30		Medial giant fibers	15-20	100-250 ^a	20	appr. 0.12
31		Chela, fast-closer	20	58		0.34
32		slow-closer	10	41		0.25
33		opener	8	36		0.22
34	<i>Homarus</i>	Medial giant fiber	18	125		0.14
35		Large fiber in cord	7	70		0.10
36		Chela, fast-closer	18-20	80-125		appr. 0.2
37		opener	14-18	70-90		0.2
38		Leg, fast-closer	12-18	70-100		0.17

(¹) Velocity (v) in m/sec (in myelinated fibers) in vertebrates is directly proportional to outside diameter (d) in μ ; $v = kd$. $K \approx 6$ in mammals; $K \approx 2$ in frogs. Temperature coefficient = 1.8 for 10°.

(²) A fibers = myelinated fibers of somatic system, some-

times subdivided into α , β , γ and δ in order of descending velocity in ratio of approximately 100:60:40:25; B fibers = myelinated (usually preganglionic) fibers of autonomic nervous system; C = non-myelinated fibers.

(Table continues on next page)

(Continuation of Table 3.4)

	Animal	Nerve Fiber	Velocity ¹ (m/sec)	Diameter incl. Sheath μ	Temp. (°C)	v/d ¹
	A	B	C	D	E	F
INVERTEBRATES (Continued)						
39	<i>Homarus</i>	Leg opener	7-13	40-80		0.17
40	<i>Callinassa</i>	Giant fibers	6.0-7.5	35-40	20-22	0.18
41	<i>Leander</i>	Giant fibers	18-23	35	17	0.6
42	<i>Periplaneta</i>	Giant fibers	9-12	10-40		0.3
43	<i>Limulus</i>	Optic nerve	2	6		0.3
Mollusca						
44	<i>Loligo forbesi</i>	Stellar n., incl. giant fibers	5, 7.5, 11, 16	50, 100, 200, 400	20	0.04-0.1
45	<i>Loligo pealii</i>	Giant fibers	18	260	23	0.09
46		Giant fibers	23.5 (21.5-25)	350	23	0.067
47		Giant fibers	30 (27.5-32)	450	23	0.067
48		Giant fibers	35	520	23	0.067
49	<i>Sepia</i>	Giant fibers	3, 8	35, 150	20	0.05, 0.09
50		Giant fibers	7.05	231	17	0.03
51		Giant fibers	6.90	168	15	0.04
52		Giant fibers	6.17	126	16	0.05
53	<i>Aplysia</i>	Pleurovisceral connective, max.	1	35-50	23	0.03
54	<i>Ariolimax</i>	Pedal n. (fastest wave)	0.83	35	21.8	0.024
55	<i>Helix</i>	Visceral n. (fastest wave)	0.6-0.7			
56	<i>Mya</i>	Pallial n. (fastest wave)	1			
57		Cerebrovisceral connective	0.2-0.5	>4	17	
Annelida						
58	<i>Neanthes</i>	Lateral giant fibers	5	30-37	24	0.15
59		Median giant fiber	4.5	15-18	24	0.27
60		Medial giant fibers	2.5	7-9	24	0.31
61	<i>Lumbrineris</i>	Median dorsal giant fiber	10	130	24	0.07
62		Median ventral giant fiber	4.5	27	24	0.17
63	<i>Harmothoë</i>	Lateral giant fiber	0.93	13	18	0.07
64	<i>Diopatra</i>	Giant fiber	10	130	24	0.08
65	<i>Myxicola</i>	Giant fiber	6-20	100-1000 ³	24	0.02-0.06
66	<i>Arenicola</i>	Giant fiber	2	25	24	0.08
67	<i>Aphrodita</i>	Ventral cord (no giants)	0.05			
68	<i>Lumbricus</i>	Median giant fiber	30 (15-45)	50-90 ³	22	0.3-0.6
69		Lateral giant fiber	11.3 (7.5-15)	40-60 ³	22	0.19-0.28
70	<i>Hirudo</i>	Ventral cord (no giants)	0.025			
Coelenterata						
71	<i>Aurelia</i>	Nerve net, swimming beat	0.5	6-12 ³		0.05
72	<i>Calliactis</i>	Column nerve net, longit.	0.1			
73		circ.	0.15			
74		radial	0.04			
75		Mesentery, longit. conduction	1.2			
76	<i>Metridium canum</i>	Mesenteric nerve net		5-13		
77	<i>Metridium senile</i>	Mesenteric nerve net		1-5		

(³) These fibers taper within the range of diameters given.