

Table 1. Specimens used in this study.

Species	Habitat	SVL* (mm)
<i>Siren lecertina</i>	Aquatic	261
		230
		242
<i>Amphiuma tridactylum</i>	Aquatic	408
		434
		471
<i>Necturus maculosus</i>	Aquatic	175
		172
		168
<i>Cynops pyrrhogaster</i>	Semi-aquatic	53
		48
		45
<i>Cynops ensicauda</i>	Semi-aquatic	52
		51
		54
<i>Hynobius nigrescens</i>	Terrestrial	70
		72
		73
<i>Hynobius lichenatus</i>	Terrestrial	54
		55
		53
<i>Ambystoma tigrinum</i>	Terrestrial	111
		103
		86

* Snout-vent length.

Table 2. Muscle weight ratios (%) measured at midtrunk. (mean \pm S.E.M)

Species	<i>M. dorsalis trunci</i>	<i>M. interspinalis</i>	<i>M. intertransversarius</i>	<i>M. subvertebralis</i>	<i>M. obliquus externus, M. obliquus externus superficialis + M. obliquus externus profundus</i>	<i>M. transversus abdominis, M. obliquus internus + M. transversus abdominis</i>	<i>M. rectus abdominis, M. rectus profundus + M. rectus abdominis</i>
<i>Siren intermedia</i>	35.1 \pm 0.3 de	3.4 \pm 0.5 cd	2.4 \pm 0.1 c	6.1 \pm 0.3 e	24.6 \pm 0.5 a	25.7 \pm 0.4 a	2.5 \pm 0.3 d
<i>Amphiuma tridactylum</i>	33.3 \pm 0.8 e	3.2 \pm 0.4 cd	2.1 \pm 0.3 c	9.5 \pm 1.3 d	23.2 \pm 1.2 ab	25.0 \pm 1.9 a	3.7 \pm 0.4 d
<i>Necturus maculosus</i>	34.0 \pm 1.8 de	3.0 \pm 0.5 d	2.0 \pm 0.3 c	10.4 \pm 0.6 cd	20.6 \pm 0.8 b	25.8 \pm 2.9 a	4.0 \pm 0.8 d
<i>Cynops pyrrhogaster</i>	38.8 \pm 1.9 cd	4.7 \pm 0.4 bc	2.5 \pm 0.2 bc	13.1 \pm 0.4 bc	14.6 \pm 1.8 c	14.1 \pm 1.8 b	9.1 \pm 0.4 c
<i>Cynops ensicauda</i>	40.6 \pm 1.3 bc	4.0 \pm 0.2 bcd	2.6 \pm 0.1 bc	11.4 \pm 0.5 cd	11.5 \pm 1.0 cd	16.7 \pm 0.6 b	9.6 \pm 0.6 c
<i>Hynobius nigrescens</i>	46.4 \pm 2.3 a	5.0 \pm 0.3 b	3.4 \pm 0.5 a	14.4 \pm 0.5 ab	10.4 \pm 2.6 de	7.3 \pm 1.2 c	13.1 \pm 1.5 ab
<i>Hynobius lichenatus</i>	47.3 \pm 1.2 a	5.1 \pm 0.3 ab	3.2 \pm 0.2 ab	14.2 \pm 0.7 ab	7.1 \pm 0.2 ef	8.0 \pm 0.5 c	15.0 \pm 1.6 ab
<i>Ambystoma tigrinum</i>	45.8 \pm 3.8 ab	6.7 \pm 1.2 a	3.5 \pm 0.2 a	16.6 \pm 2.1 a	5.9 \pm 0.4 f	7.5 \pm 2.5 c	12.1 \pm 0.2 b

Different superscript letters indicate significant differences.

Same superscript letters represent no significant differences. (ANOVA and Tukey's test, $p < 0.05$)

Table 3. Specimens used for measuring prezygapophyseal angle of vertebra in this study.

Species	Habitat	SVL* (mm)
<i>Siren lecertina</i>	Aquatic	261
		230
		242
<i>Amphiuma tridactylum</i>	Aquatic	408
		434
		471
<i>Necturus maculosus</i>	Aquatic	175
		172
		168
<i>Andrias japonicus</i>	Aquatic	420
		408
		642
<i>Cynops pyrrhogaster</i>	Semi-aquatic	53
		48
		45
<i>Hynobius nigrescens</i>	Terrestrial	70
		72
		73
<i>Hynobius lichenatus</i>	Terrestrial	54
		55
		53
<i>Ambystoma tigrinum</i>	Terrestrial	111
		103
		86

* Snout-vent length.

Table 4. Prezygapophyseal angle of mid-trunk vertebra. (mean \pm S.E.M)

Species	habitat	prezygapophyseal angle	
<i>Siren intermedia</i>	Aquatic	10.8 \pm 0.7	c
<i>Amphiuma tridactylum</i>	Aquatic	14.0 \pm 2.6	abc
<i>Necturus maculosus</i>	Aquatic	12.6 \pm 4.6	bc
<i>Andrias japonicus</i>	Aquatic	18.6 \pm 4.0	ab
<i>Cynops pyrrhogaster</i>	Semi-aquatic	17.5 \pm 0.5	abc
<i>Hynobius nigrescens</i>	Terrestrial	17.7 \pm 2.4	abc
<i>Hynobius lichenatus</i>	Terrestrial	19.1 \pm 2.3	ab
<i>Ambystoma tigrinum</i>	Terrestrial	21.6 \pm 2.0	a

Different superscript letters indicate significant differences.

Same superscript letters represent no significant differences.

(ANOVA and Tukey's test, $p < 0.05$)

Table 5. Averages of prezygapophyseal angle in different habitat. (mean \pm S.E.M)

habitat	prezygapophyseal angle	
Aquatic	14.0 \pm 4.1	a
Semi-aquatic	17.5 \pm 0.5	ab
Terrestrial	19.5 \pm 2.6	b

Different superscript letters indicate significant differences.
Same superscript letters represent no significant differences.
(ANOVA and Tukey's test, $p < 0.05$)

Table 6. Specimens used in this study.

Species	Habitat	SVL* (mm)
<i>Siren lecertina</i>	Aquatic	261
		230
		242
<i>Amphiuma tridactylum</i>	Aquatic	408
		434
		471
<i>Cynops pyrrhogaster</i>	Semi-aquatic	53
		48
		45
<i>Cynops ensicauda</i>	Semi-aquatic	52
		51
		54
<i>Hynobius nigrescens</i>	Terrestrial	70
		72
		73
<i>Ambystoma tigrinum</i>	Terrestrial	111
		103
		86

* Snout-vent length.

Table 7. Muscle area ratios (%) measured at three parts in trunk. (mean \pm S.E.M.)

species	position of trunk		muscle area ratio	
<i>Siren intermedia</i>	dorsalis muscles	anterior	53.4 \pm 0.7	a
		middle	53.2 \pm 0.4	a
		posterior	51.6 \pm 0.9	a
	lateral hypaxial muscles	anterior	43.7 \pm 0.7	a
		middle	42.3 \pm 1.4	a
		posterior	44.2 \pm 1.4	a
	abdominal muscle	anterior	2.7 \pm 0.1	b
		middle	3.3 \pm 0.2	a
		posterior	2.8 \pm 0.2	ab
<i>Amphiuma tridactylum</i>	dorsalis muscles	anterior	52.6 \pm 0.5	a
		middle	53.2 \pm 0.4	a
		posterior	51.6 \pm 0.9	a
	lateral hypaxial muscles	anterior	44.1 \pm 0.7	a
		middle	42.8 \pm 0.5	a
		posterior	44.7 \pm 0.9	a
	abdominal muscle	anterior	3.2 \pm 0.2	b
		middle	3.9 \pm 0.1	a
		posterior	3.6 \pm 0.2	ab
<i>Cynops pyrrhogaster</i>	dorsalis muscles	anterior	57.8 \pm 1.9	a
		middle	62.5 \pm 2.1	a
		posterior	57.6 \pm 3.3	a
	lateral hypaxial muscles	anterior	35.9 \pm 1.7	a
		middle	26.9 \pm 1.5	b
		posterior	33.4 \pm 2.9	a
	abdominal muscle	anterior	6.2 \pm 0.1	b
		middle	10.4 \pm 0.5	a
		posterior	8.9 \pm 1.1	a
<i>Cynops ensicauda</i>	dorsalis muscles	anterior	55.0 \pm 0.3	b
		middle	59.2 \pm 1.4	a
		posterior	53.6 \pm 0.3	b
	lateral hypaxial muscles	anterior	37.3 \pm 0.9	a
		middle	30.8 \pm 1.1	b
		posterior	38.6 \pm 0.4	a
	abdominal muscle	anterior	7.6 \pm 0.7	b
		middle	9.9 \pm 0.2	a
		posterior	7.7 \pm 0.6	b
<i>Hynobius nigrescens</i>	dorsalis muscles	anterior	57.5 \pm 0.9	b
		middle	67.7 \pm 1.2	a
		posterior	59.6 \pm 0.5	b
	lateral hypaxial muscles	anterior	33.2 \pm 1.7	a
		middle	16.9 \pm 1.9	b
		posterior	30.6 \pm 1.2	a
	abdominal muscle	anterior	9.2 \pm 0.9	b
		middle	15.3 \pm 3.1	a
		posterior	9.8 \pm 0.8	b
<i>Ambystoma tigrinum</i>	dorsalis muscles	anterior	62.7 \pm 0.3	b
		middle	73.1 \pm 1.0	a
		posterior	62.9 \pm 0.9	b
	lateral hypaxial muscles	anterior	29.3 \pm 0.5	a
		middle	14.5 \pm 1.2	b
		posterior	28.8 \pm 0.6	a
	abdominal muscle	anterior	7.9 \pm 0.5	b
		middle	12.3 \pm 0.6	a
		posterior	8.2 \pm 0.6	b

Different superscript letters indicate significant differences among positions.

Same superscript letters represent no significant differences. (ANOVA and Tukey's test, $p < 0.05$)

Table 8. Specimens of *Hynobius nigrescens* used in this study.

developmental stage	habitat	SVL* (mm)
st38	Aquatic	7.2
		7.3
		7.5
st50	Aquatic	9.9
		10.5
		10.8
st58	Aquatic	12.9
		13.5
		14.1
st63A	Aquatic	16.8
		17.1
		17.2
st66	Aquatic	21.1
		21.6
		22.2
st68	Terrestrial	24.9
		25.2
		25.7

* Snout-vent length.

Table 9. Ontogenetic changes of weight ratios of trunk muscles in *H. nigrescens*. (mean \pm S.E.M.)

developmental stage	averages of Log SVL*(mm)	Dorsalis muscles	Lateral hypaxial muscles	Abdominal muscle
st38	0.87	52.2 \pm 2.3	47.7 \pm 2.3	0.0
st50	1.02	55.1 \pm 2.3	44.8 \pm 2.3	0.0
st58	1.13	55.3 \pm 1.8	41.7 \pm 2.2	3.0 \pm 0.4
st63A	1.23	56.7 \pm 2.6	38.3 \pm 2.9	4.9 \pm 0.3
st66	1.34	60.0 \pm 1.2	29.9 \pm 2.4	10.0 \pm 1.3
st68	1.40	61.4 \pm 2.3	22.1 \pm 3.5	16.5 \pm 1.4

Different superscript letters indicate significant differences.

Same superscript letters represent no significant differences. (ANOVA and Turkey's test, $p < 0.05$)

* Snout-vent length.