Effects of strain on growth performances of triploid Thai walking catfish, *Clarias macrocephalus*

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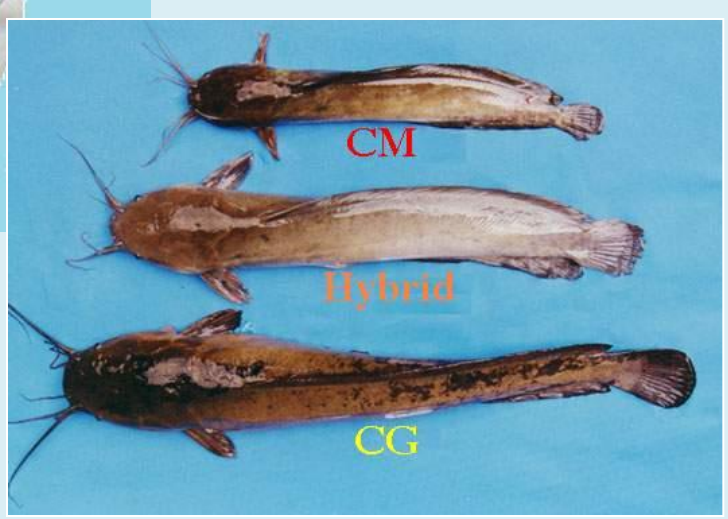
Advantages of triploids

http://www.rivergwashtroutfarm.com/

http://www.overtonfisheries.com/

http://www.coastseafoods.com/

Thai walking catfish



Freshwater aquaculture production by species

freshwater prawn

striped catfish

snake-head

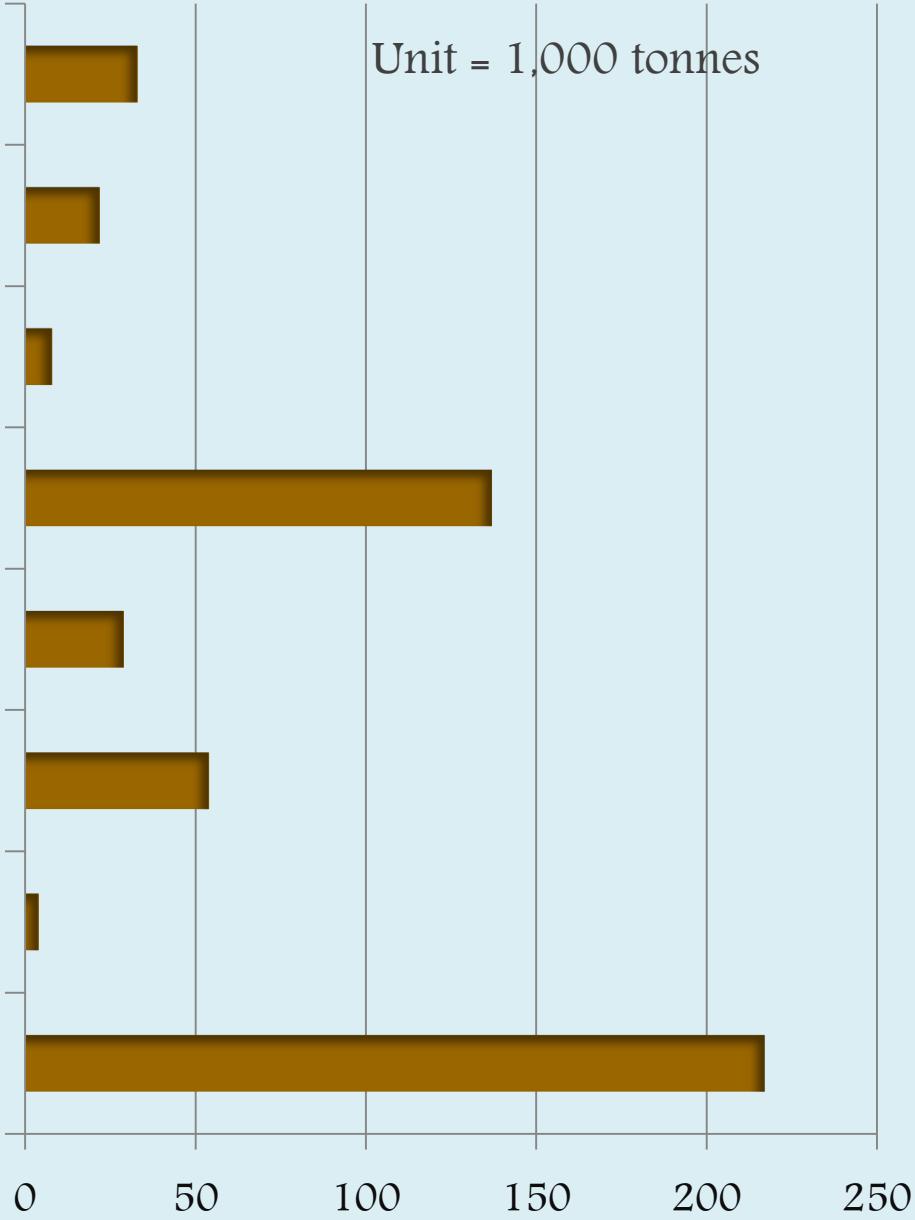
walking catfish

snake-skin gouramy

silver barb

common carp

Nile tilapia



- Previous studies on triploid Thai walking catfish showed different results.

  - Na-nakorn & Lakaanantakun(1993) diploids > triploid

  - Fast *et al*. (1995) triploids > diploid

- *Clarius fuscus*: triploids > diploids (Qin *et al*., 1998)
- *Clarius gariepinus:* triploids = diploids (Henken et al., 1987)

Framework of the project

effects of strains on triploid performances

mechanisms of the growth differences

mechanisms of sterility

Objectives

- To study effects of parental strains on performance of triploids

Materials and Methods

Strains	KU	UD
KU	KUKU	KUUD
UD	UDKU	UDUD

Control

28±3 °C ambient temperature

Cold shock

7 °C, 25 min duration, 0 min AF

Growth trial

30-60 D: 4 replicates in fibre glass tanks (1x1.5 m^2) 500 fry/tank

61-240 D: 4 replications in concrete tanks (1x2 m^2) at 75 fingerlings/tank

Data collection: BW, BL, AGR, SGR, condition factor

Sterility

Gonadosomatic indices at 240 D

Data analyses

$$y_{ijk} = \mu + S_i + D_j + T_k + (SxD)_{ij} + (SxT)_{ik} + (DxT)_{jk} + (SxDxT)_{ijk} + e$$

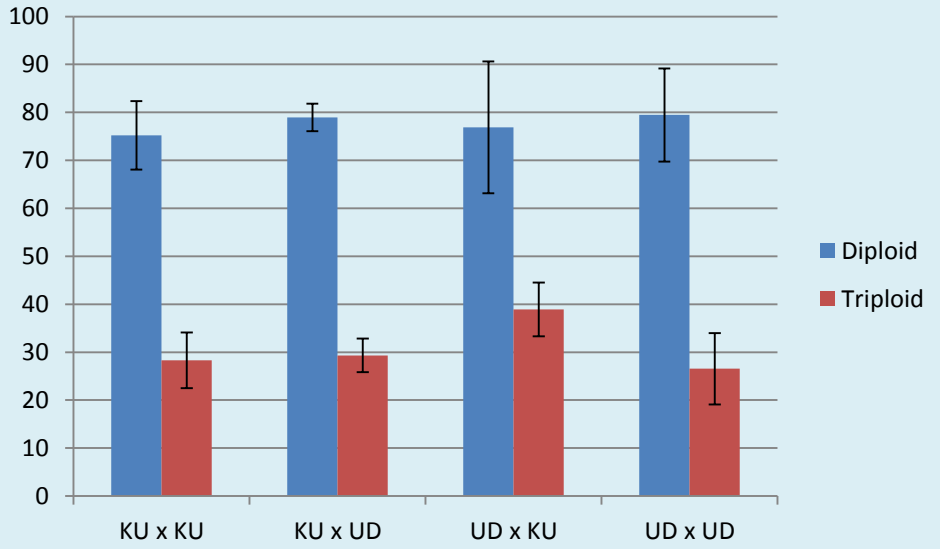
where

y_{ijk} = trait, μ=constant, S_i=sire strain, D_j=dam strain, T_k=treatments (control or cold-shocked),
SxD = interaction between sire and dam,
SxT = interaction between sire and treatments,
DxT = interaction between dam and treatments,
SxDxT= interaction between sire, dam and treatments,
e = error

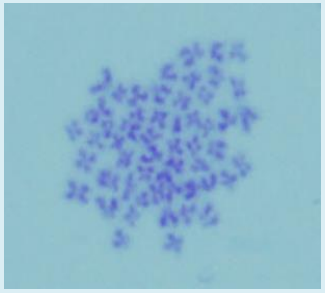
Survival rates are included in the model for the analyses of the traits that may be affected by them.

RESULTS

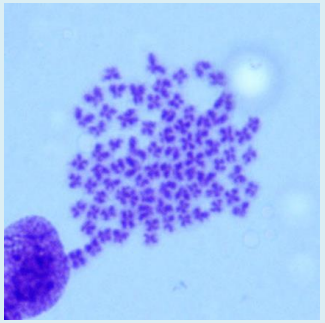
Hatching rate



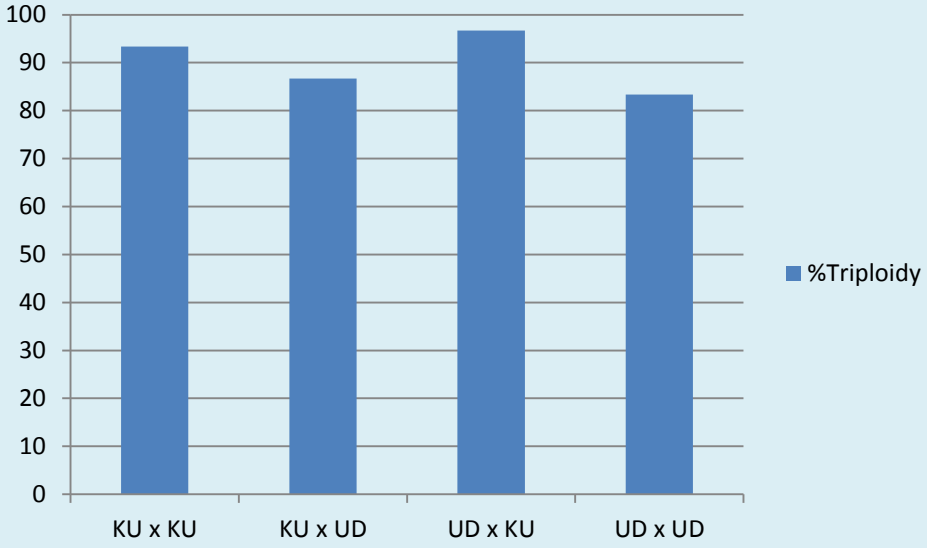
Success rate



2n = 54



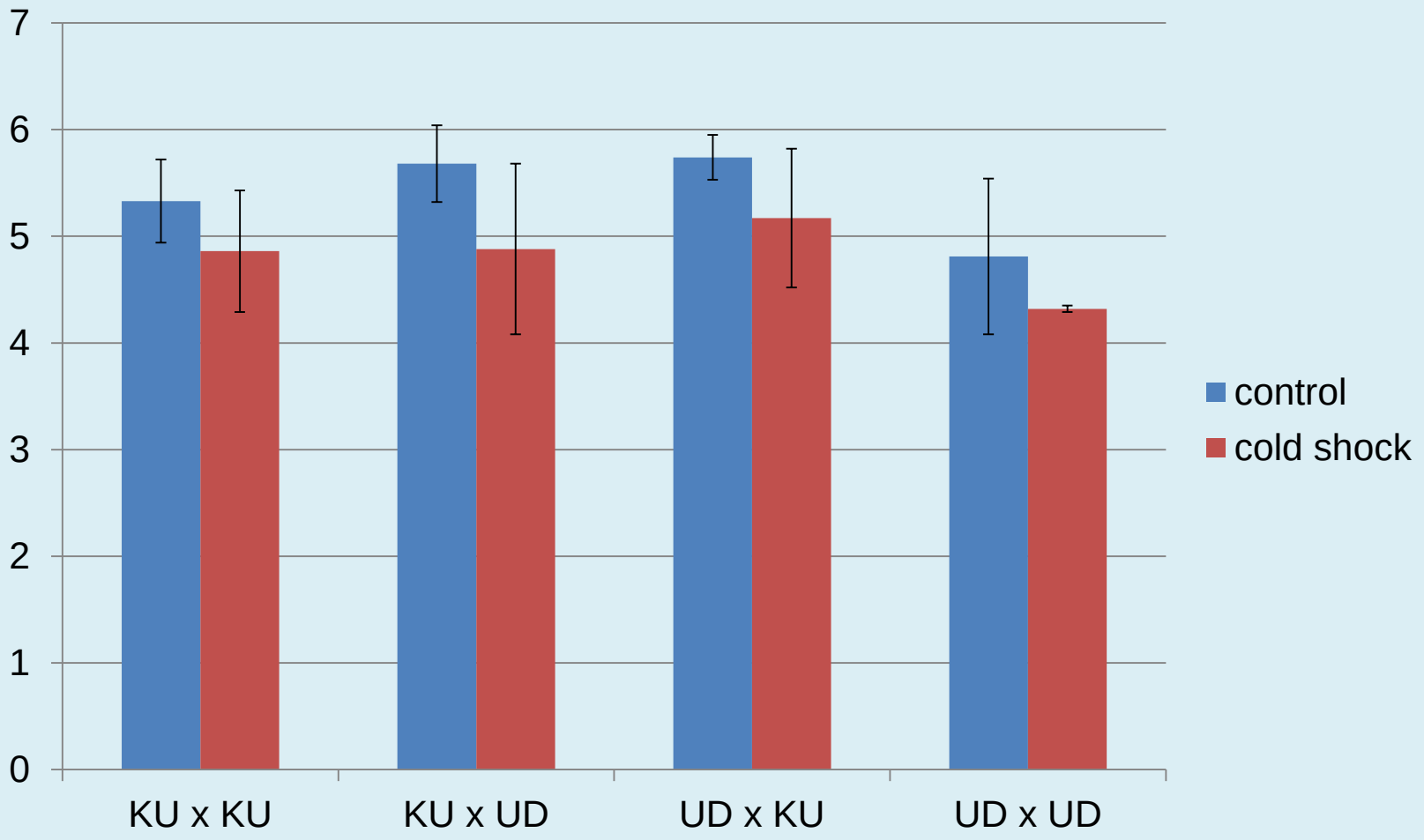
3n = 81



Results: 30-60 D

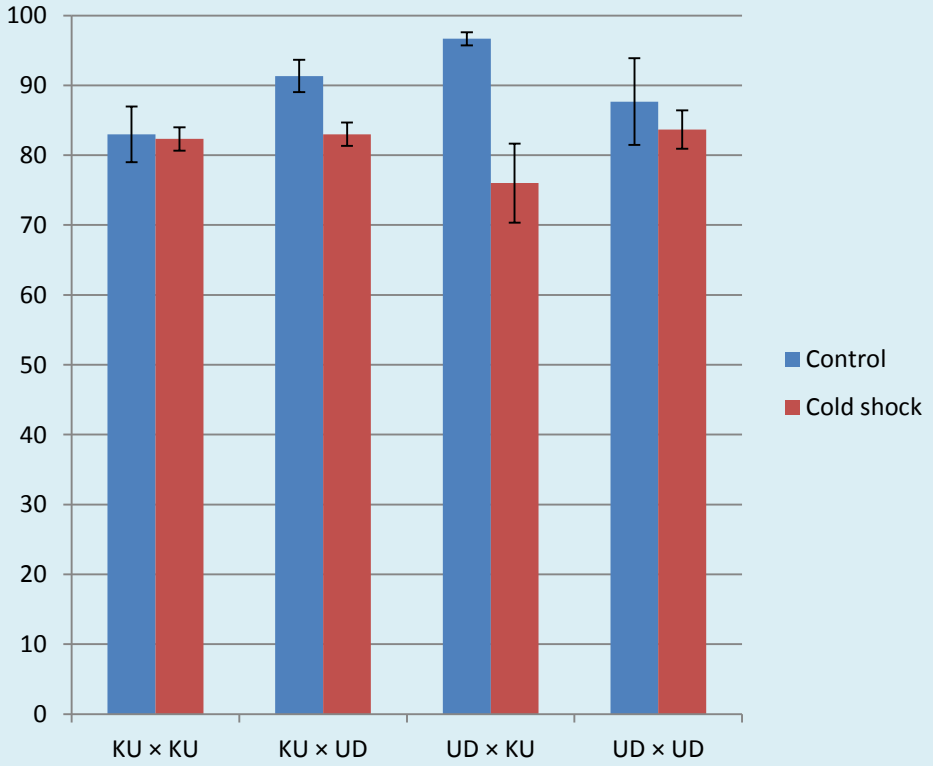
Factors/traits	BL	BW	AGR	SGR
Sire	ns	ns	ns	ns
Dam	ns	ns	ns	ns
Treatment	✓	✓	✓	✓
SirexDam	ns	ns	ns	ns
SirexTreatment	ns	ns	ns	ns
DamxTreatment	ns	ns	ns	ns
SirexDamx Treatment	ns	ns	ns	ns

SGR (30-60 D)



Growth Trial 61-240 D: survival

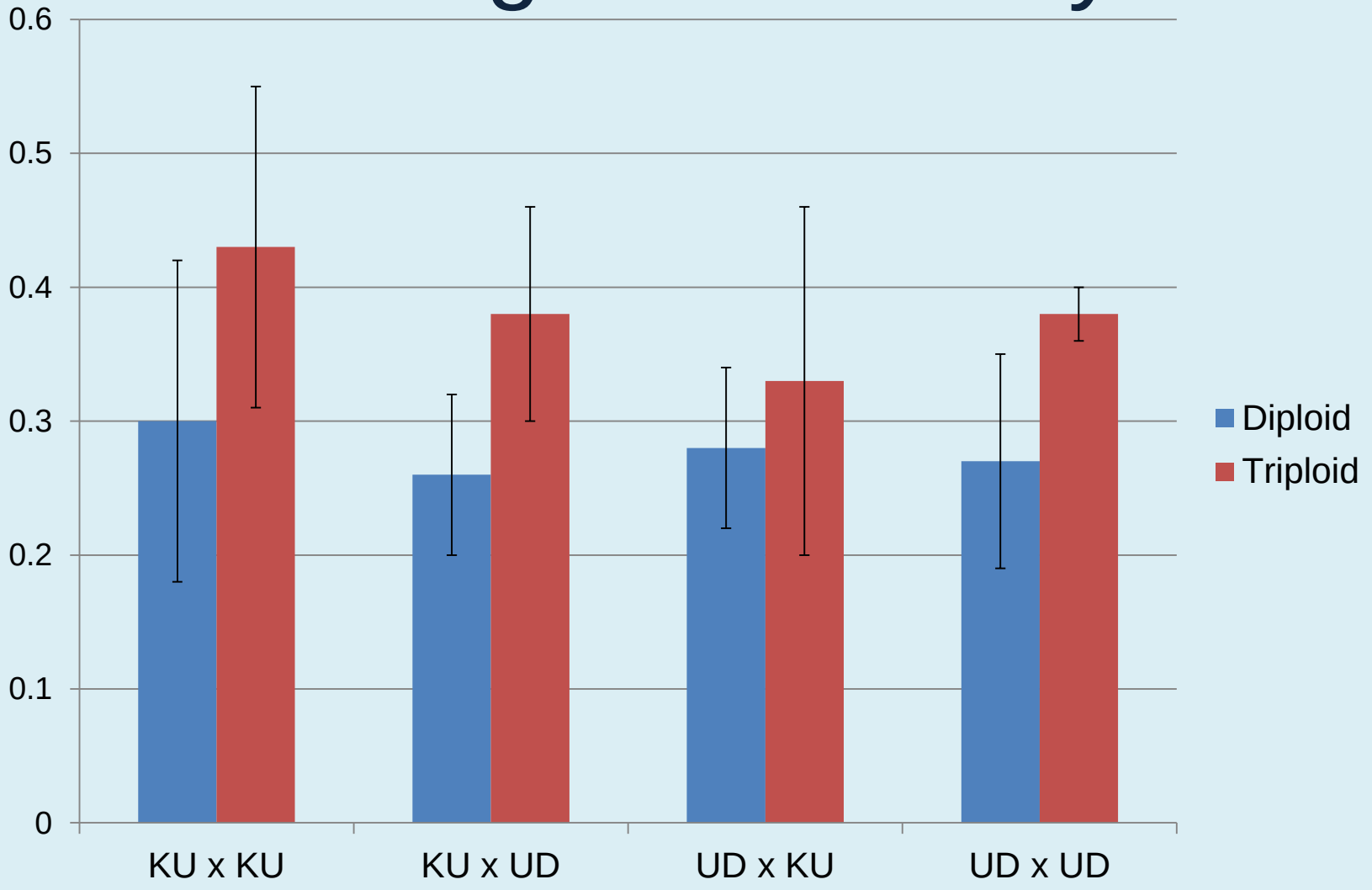
Factors/traits	SUR
Sire	ns
Dam	ns
Treatment	✓
SirexDam	ns
SirexShock	ns
DamxShock	ns
SirexDamx Treatment	✓



Effects of Strains on Triploid: 90-240 D

Traits/ Factors	S	D	T	DxS	SxT	DxT	SxDxT
BL_{90D}	ns	ns	ns	ns	*	ns	ns
BL_{180D}	ns	ns	ns	ns	ns	ns	*
BW_{90D}	ns	ns	ns	ns	*	ns	ns
BW_{120D}	ns	ns	ns	ns	*	ns	ns
BW_{180D}	ns	ns	ns	ns	ns	ns	*
$AGR_{61\text{-}90D}$	ns	ns	ns	ns	*	ns	ns
$AGR_{121\text{-}180D}$	ns	ns	ns	ns	ns	ns	*
$SGR_{61\text{-}90D}$	ns	ns	ns	ns	*	ns	ns
$SGR_{91\text{-}120D}$	ns	ns	ns	ns	*	ns	ns
$SGR_{180\text{-}240D}$	ns	ns	*	ns	ns	ns	ns

SGR during 180-240 days old



Conclusion

- Neither sire nor dam had significant effects on growth of triploids.
- Only treatments had significant effects on BL, BW, AGR, SGR during 61-90 days old (Triploids<Diploids).
- Treatments had significant effect on survival rate at 240 days old (Triploids<Diploids) and SGR during 180-240 days old (Triploids>Diploids).

On-going work

- The preliminary results showed no differences in IGF-I expression between diploids and triploids. Therefore, transcriptomes are analysed in collaboration with Dr.Robert Devin, Center for aquaculture and environmental Research, Fisheries and Ocean, Canada.
- In collaboration with Dr.Sirawut Klinbugna, BIOTEC Thailand, full length of the Maturation Promoting Factor genes: *cyclin B1* and cell division cycle 2 (*Cdc2*) of *C. macrocephalus* were characterized.
- Expression patterns of these genes are studied in diploid and triploids. Our preliminary results showed that expressions of *cyclin B1* and *Cdc2* were completely suppressed in gonad of *C. macrocephalus.*

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