Recent exposed to one male per species on

Recent findingsThe general experimental setup consisted of two-waymate choice experiments. Gravid females were exposed to one male per species onboth sides of a fish tank.

Two different settings were used. One in which femalesand males were completely isolated, both chemically and partly visually. In thesecond setup, visual barriers where absent and chemical communication waspossible. These setups provided the basis for the following findings. Wright et al. tested if rearing light conditionsaffect female preference. Created light mimicked the natural light conditions ofboth species.

The experiment showed that rearing light conditions, so thevisual environment, significantly affected female preference for courtship behaviourof both species. As expected, females reared under shallow water lightconditions preferred P. pundamilia males. In contrast tothis result, females reared under deep water light conditions did not show anypreference. These findings were based on typical courtship behaviourobservations of both males, quiver and lateral display, and females whichnormally move to or either away from the male. Possible effects of test light, female species and male size were nonsignificant. They proposed two possible explanations. First, the used light conditions induce the expression of certain pigments, like opsin, which cause either red of blue colourations.

The second explanationinvolves the exposure of females to certain male phenotypes which could cause imprintingof colour preferences. Beside examining femalepreferences, they also explored the extent in which these species showedassortative preference. They reviewed all models and

excluded results of hybridfemales. These results showed strong interaction between female species andrearing light conditions in terms of lateral display and quiver behaviour. Thisindicates that both species respond stronger to conspecific males when rearedunder their natural light conditions compared to unnatural light conditions.

P. pundamilia females reared in shallowwater conditions preferred conspecific males, but when reared under deep waterconditions they did not. P. nyererei females, both reared in deep and shallow conditions, did not show any preference.

Poolingand re-categorizing light, deep/shallow and natural/unnatural conditions, showed that the rearing environment significantly affects the assortativepreference in terms of quiver behaviour, but not lateral display. These resultsshow that heterogeneity in their local habitat is linked to female preferencesand eventually reproductive isolation. This means that changes in localconditions, like climate change or migration, can influence the reproductionand thus survival of these species. Even though theirfemale preference experiments do show clear result, the overall repeatabilitywas low. Lower repeatability was observed at P. nyererei females compared to P. pundamilia and hybrid females, but this was not caused due to the twodifferent light conditions either due to their experimental setup. No differencein female preference between the earlier mentioned setups was observed.

Eventhough they did not observe any significant setup effect, they did observe moreactive females and positive responses to lateral male display in

setup 2, whichallows chemical exchange and visual communication. Compared to lateral display behaviour, less positive responses to male quiver behaviour were observed. Separate femalepreference analysis between setups showed increased fish activity in setup 2but no setup effect on preference scores. These results suggest that femalepreference is not affected by chemical communication. In addition, they examinedthe effect of test light on fish activity. They showed that test light did not affectfish activity, in terms of female response to males, and female activity. Femalesdid somewhat more respond to male lateral display in deep light conditions thanfor quiver behaviour. Compared to P.

pundamilia females, P. nyererei femalesresponded more to male quivers under shallow water light conditions. Ingeneral, hybrid females were more active compared to P.

nyererei and P. pundamiliaand no difference between these species was observed. Male courtship activitywas similar in both shallow and deep light conditions. However, male courtshipbehaviour of P.

pundamilia was morefrequently observed under deep light conditions, whereas frequencies of P. nyererei were similar under bothconditions. Discussion and future developmentsRearing both species, including their hybrids, under various light conditions showed that the visualenvironment during development affects female preference.

Two explanations wereproposed, related to expression of certain pigments, like opsin, and imprintingfor male colour preferences. Previous studies showed increased expression ofopsin concentration in fish, as response to

changes in visual environment. Thisrelation is not straightforward, as it depends on more complex interactionsbetween genotypes, rearing environment and test environment.

More researchfocused on pigment expression under these light conditions in pundamilia species is needed. Eventhough it is shown that perceptual variation affects female preference, we cannotconclude that it completely determines female preference. In that case we wouldhave seen stronger interactions between test light and rearing lightconditions. Also, even though imprinting for male colourations is unlikely, future research should focus on individually housing and controlling the fishprior to similar experiments. Furthermore, even though species assortativepreferences were significant, the results were surprisingly weak. This might bedue to the used light conditions. Specific light spectra were used to mimicnatural conditions, but these differ strongly compared to those used inprevious studies.

Another explanation could be due to filial imprinting as frywas removed 5-6 days after birth and housed in family groups. This way differsfrom the natural maternal care, mouth brood, which allows imprinting of theirparent phenotype. Another last explanation could be due to selective survivalwhich is possible as the used individuals originated from wild caughtindividuals that might have caused strong genetic variation and thus anonrandom test population.