**Examiner’s Report**

**Student:** [Student Name]

**Dissertation / Research Project:** [Title]

**Recommended grade:**

Please indicate % mark in the relevant box below. Grade level descriptors are provided at the end of this document to assist you in determining an appropriate grade.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Class of Honours** | 1st | | | 2nd div I | 2nd div II | | None | | | Fail |
| Grade | A+ | A | A- | B+ | B | B- | C+ | C | C- | D |
| GPA | 9 | 8 | 7 | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| % mark range | 100-90 | 89-85 | 84-80 | 79-75 | 74-70 | 69-65 | 64-60 | 59-55 | 54-50 | <50 |
| **Recommended % mark** |  |  |  |  | X |  |  |  |  |  |

**Please comment on the dissertation under the following headings:**

Introduction & statement of problem

Good:

* Description of the Black Queen idea
* Description of potential examples & public goods in bacteria etc.

Weak:

* From the proposal, I couldn’t tell if the “Black Queen Hypothesis”, or the strong version of the same, was just a hypothesis along the lines of “sometimes this Black Queen thing happens”, or if it was a more explanatory hypothesis, e.g. “this happens in conditions XYZ”.

Methodology & mastery of techniques

The methodology appears to be, basically, to run an agent-based simulator over a variety of input parameters, and see if/when the Black Queen emerges? I think this is fine as exploratory work, but it would be nice if the Proposal at least offered a plan (e.g. in a table) for which parameters, what they mean, what values they would take, etc.

Could have included a discussion of coding language, likely resourced needed etc.

Results, data treatment & analysis

The data is basically simulations, so mostly N/A. Could have included a discussion of how simulation outcomes would be measured & statistically compared – I imagine that this might not be trivial, given a wide variety of possible simulation outcomes?

Discussions & conclusions

I think this work would benefit from connecting with several related bodies of literature:

* Lynch’s “constructive neutral evolution” idea – e.g. proteins become interdependent because of mutations that are neutral at the time, but create dependency which is then irreversible. Couldn’t this also produce a black-queen like phenomenon?
* Standard ecology microbial coexistence experiments & theory. I believe there are classic results here about how 2 species cannot coexist if they have the same needs but one is better at getting the resources, but they can if they each specialize on different resources. Could Black Queen-type ideas be integrated into this kind of framework?
* Coevolution, ecological “irreducible complexity” i.e. codependence or coadaptation, E.g. Darwin, in the Origin of Species:  
    
  “How have all those exquisite adaptations of one part of the organisation to another part, and to the conditions of life and of one organic being to another being, been perfected? We see these beautiful co-adaptations most plainly in the woodpecker and the mistletoe; and only a little less plainly in the humblest parasite which clings to the hairs of a quadruped or feathers of a bird; in the structure of the beetle which dives through the water; in the plumed seed which is wafted by the gentlest breeze; in short, we see beautiful adaptations everywhere and in every part of the organic world.”

It may be that this framework already exists, and the idea is that codependence can evolve through mutual benefit, neutral processes, and mutual cheating? How many colors of queen can there be?

Organisation & presentation

Pretty good – the big weakness in the proposal is the pretty nonspecific description of the research to be done. This can be OK with simulation studies, I think the research will go fine with guidance, but if the idea of a proposal is to present a well-thought-out plan, there could be more done on this front. And, it can be useful in a simulation study to have a rather discrete plan for the experiments to be done, to avoid the endless “simulate until something interesting pops up, or doesn’t” situation.

Originality

Look for more discussion of the above big issues in the eventual these.

Other comments (supervisor should comment here on degree of assistance required to complete experiments/produce the dissertation)

Minor comments

Some of the writing is a bit rough, eg typos or mis-phrased; could use another edit

Italicize genus & species, e.g.:

Prochlorococcus

Synechococcus

Name of examiner: \_Nick Matzke\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Signature: \_\_

**POSTGRADUATE DISSERTATIONS AND PROJECTS**

**MARKING GUIDELINES**

|  |  |  |  |
| --- | --- | --- | --- |
| **Grade** | **Short comment** | **Explanation** | **Description** |
| A+ 90-100% | Exceptionally high level of performance | Fulfils all descriptors to an unusually high standard | * Well-structured and integrated research plan; * Well formulated research questions and appropriate investigative methodology used; * Excellent knowledge and understanding of subject; * Excellent knowledge of the literature and critical evaluation of previous work; * Significant new technical skills mastered * Appropriate data collected (if applicable) and rigorous and critical data analysis; * Clear understanding of significance of the data/evidence; * High level of critical thinking; * Arguments presented logically and coherently; * Conclusions comprehensive and well-justified; * Research project/dissertation well-constructed and appropriately illustrated. |
| A 85-89% | Clear high quality performance | Fulfils all descriptors to a high standard |
| A- | First class | Fulfils all descriptors to a high standard but not consistently |
| 80-84% |  |
| B+ | Very good | Fulfils all descriptors to a high standard by not consistently | * Sound research plan; * Good formulation of research questions and appropriate investigative methodology used; * Good grasp of subject matter; * Good knowledge of the literature and evaluation of previous work; * Appropriate data collected (if applicable) and good data analysis; * Some appreciation of the significance of the data/evidence; * Evidence of critical thinking; * Arguments presented reasonably well; * Some sound conclusions drawn; * Research project/dissertation reasonably well constructed and illustrated |
| 75-79% |  |
| B | Good | Fulfils most descriptors to a good standard |
| 70-74% |  |
| B- | Competent | Fulfils most descriptors to a good standard, but not consistently |
| 65-69% |  |
| C+ | Clear pass | Fulfils most descriptors to a competent standard | * Reasonable research plan outlined; * Research questions formulated and adequate research methodology applied; * Knowledge of subject matter shown but with some lapses, inadequacies and errors; * Adequate attempt at data analysis (if applicable) but may lack adequate justification; * Originality and critical thinking present but limited; * Arguments supported by some evidence; * Research project/dissertation adequately presented |
| 60-64% |  |
| C | Pass | Fulfils most descriptors to a competent standard but not consistently |
| 55-59% |  |
| C- | Marginal pass | Fulfils some descriptors to an adequate standard |
| 50-54% |  |
| D | Fail | Fails to fulfil enough descriptors to a competent standard | * Work lacks breadth and depth; |
| <50% |  | * Understanding and coverage inadequate; * No attempt at interpretation; |
|  |  | * Research project/dissertation poorly presented |