

CHAPTER I

INTRODUCTION

1.1. Research Background

Biology course is one of the courses that students and teachers experience difficulty because it has many abstract concepts that may cause students have difficulty in constructing knowledge. In the learning process, the establishment of teaching materials concepts is very important because it can affect the students understanding directly which these concepts form the basic thinking to solve problems. In line with the development of science and technology, scientific concepts that exist also change. However, due to various factors, such as information lag, causing the new concepts has not been known so it can not immediately update. If the concepts owned by teachers and students opposed with the scientific concepts will cause barriers to the acceptance of new concepts that will be studied (Sakdiah, 2011).

Misconceptions are generally resulted from some sources, such as (1) personal experience, (2) the use of inappropriate language by teachers, (3) teacher explanations and teaching methods, and (4) background of teacher education (Fadillah, 2014). Teachers who have difficulty in delivering teaching materials may use alternative teaching methods that will be able to be understood by the students. As educators, service and pre-service teachers have a significant influence on students' knowledge and understanding that increase the probability of misunderstanding which they hold to be embedded in the students they teach. In order for teachers to implement the strategy of conceptual change among their students, they need to have a very high standard in content knowledge and a high level of awareness of students' misconceptions. Misconceptions are resistant because has happened interference between the concepts learned with the concept being studied, so that if it neglected, and not immediately followed up will have a negative impact on the learning process further (Pabucu and Geban, 2006).

Various terms are used to show misconception, that is: naïve concept, alternative conception, misunderstanding, or erroneously thought (Bell, 1981; Yip, 1998; Bahar *et al.*, 1999). Many of literatures show that the understanding of biological concepts that is not accordance with the literatures or scientific concept called misconception (Blosser, 1987; Tekkaya, 2002). Misconceptions in science concepts occurred in many countries ranging from elementary to university level (Novak, 1984). In biology, many natural concepts are relate one each other, therefore, if there is a misconception in the concepts could result misconceptions in the other concepts (Tekkaya, 2002). Biological concept that is abstract will difficult to be understood by teachers and students so that will easily cause misconceptions (Tambunan, 2011). Misconceptions are usually found in some topic, for examples, in photosynthesis, genetics, circulatory system, cells, respiration, nervous system, invertebrate and vertebrate, and evolution (Tekkaya, 2002).

Invertebrate classification is one of the most common concepts provide the possibility of misconception, because of the many abstract concepts, for example Platyhelminths, Nematelminths, and Annelids are difficult to differentiate because all of them are in the form of worms; Arthropods have a lot of class classification so that the grouping often mistaken, and Echinoderms that all examples are rarely/almost never encountered in everyday life. Based on interviews that author did with six biology high school teachers at District of Medan Kota showed that some teachers are wrong classifying animals. Spiders were classified as insects, bees lived in the nest and can not fly away, bee sting many times, the insects can not live in water, and earthworms that had been cut in half still survive (Panggabean, 2012). Bucher *et al.* (2010) found that from all teachers that teach the topic of invertebrate classification have difficulties in explaining the topic. Teachers who have not mastered the matters or misunderstood the concepts could lead to misconception; it will also have an impact on students and tend to be a danger that would disrupt the learning process (Simanek, 2007).

The role of competent teachers is needed to straighten out misconceptions. However, in reality, there are many teachers who have misconception in the learning process (Suryanto, 1997). This is caused by several things, for example teacher development patterns that are less focused, the numbers of lessons that much, inadequate facilities, and the condition of textbooks which are less supportive (Berg, 1990). Some studies revealed that misconception does not only happen in the students but also in teachers (Boo, 2004).

According to Hewindati (2004), teachers' mastery to the material is the basic thing that should be owned in the teaching and learning process. The explanation given by the teacher can be the source of student misconceptions. Therefore the teachers are expected to understand the concepts of subject matter to be taught to the students before enter the class. Students will be ready to learn when teachers ready to teach, and the teacher effectiveness to teach is an important factor in the establishment of students' concept. Misconceptions can be a latent danger due to disrupt the learning process as a result of incorrect logic when studying new concepts that true. It was called a latent danger because its existence is generally not detected when it is not being challenged from other concepts. If misconception is not removed, misconceptions will have a negative impact on subsequent learning activities (Pabucu and Geban, 2006). Based on the background that described above, the writer plans to do the research about misconception that occurred on biology teacher that entitled: **“Identification of Biology Teacher Misconception in Invertebrate Classification in Senior High School at District of Medan Kota”**.

1.2. Problem Identification

Problem that can be identified from the background, are:

1. Invertebrate is topic that provide teachers in misconception
2. Misconception is as a fact that occurred in every study field and experienced not only by students but also by teacher
3. Misconception is occurred in invertebrate topic

4. Misconception can source from personal experiences, language that used in communicate the information, learning methods or strategy, and education background.

1.3. Problem Scope

Based on the problems identified, this study is to find out the concepts that have been misconception on biology teacher in invertebrates in X SMA at Districts of Medan Kota.

1.4. Research Question

The problems of study is formulated as follows, are:

1. How is the category of misconceptions in high school biology teacher in invertebrate at district of Medan Kota?
2. What are the concepts that have been misconception on biology teacher in invertebrate?

1.5. Research Purpose

Based on research question that has been written above, the purposes of this study are:

1. To identify the categories of biology teacher misconceptions in invertebrate classification in high school at district of Medan Kota.
2. To find out the concepts that has been misconception on biology teacher in invertebrate classification.

1.6. Research Benefit

This result of research is expected to be useful to add author's knowledge about misconception problems which often occurred in education. Moreover, this study is also expected as a study material to follow up the misconception problem that occurred in high school biology teacher. This study also expected to be a research information and as reference to encourage the knowledge of biology teachers.