



INTERNET AFRREV: An International Online Multi-disciplinary Journal

Vol. 1(1) January, 2012:1-6

ISSN: 2070-0083

afrevjo.net/journals/internetafrev/vol1_no1_art1_amusan&agaviezor_moleculargenetics_jan2012.pdf

KNOWLEDGE AND AWARENESS OF MOLECULAR GENETICS TECHNIQUES AMONG AGRICULTURAL SCIENCE STUDENTS, SOUTHERN NIGERIA

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ABSTRACT

The knowledge and awareness of molecular genetics techniques among agricultural science students was tested using one hundred (100) students of the Faculty of Agriculture, University of Port Harcourt, Port Harcourt, Nigeria. A well structured questionnaire was designed and used for this purpose. The results showed that 46% of the students were males while the remaining 54% were females. Most of the students (75%) fall between 18 and 25 years. In considering the students knowledge and awareness about molecular genetics, 77% agreed that they were aware and 23% said they were not aware. Some of the molecular techniques they have heard about included gene cloning (28%), Polymerase Chain Reaction (PCR) (8%), DNA sequencing (11%), Microsatellite DNA analysis (9%), Mitochondrial DNA analysis (20%) and Bioinformatics (7%). Only 41% agreed that they can handle some of the tools or equipments used in molecular genetics. On the issue whether molecular genetics is relevant to the agricultural sector in Nigeria, all most all of the students (82%) agreed but 18% disagreed. These results show that these students are aware of these molecular genetics techniques and their relevance to the growth of agriculture but they don't have the practical knowledge which must be addressed urgently.

INTRODUCTION

Animal molecular genetics has made its importance felt in global scientific circles in a short time. The main objectives of the emerging scientific stream are identification and DNA – based diagnostics and genetically engineered vaccines for animals, studying animal genomics and its varied applications and developing embryo – transfer technology etc. The impact of molecular genetics on plants and animals has been observed long ago (Kerr, 1987) and up till now, the application of biotechnology and molecular genetics in plant and animal improvement for improved health and performance is spreading fast globally. Biotechnology uses the products and processes of living organisms to improve quality of life. It has many different applications: gene therapies to treat genetic disorders; more effective medicines tailored to individuals; vaccines to prevent disease; environmental decontamination to restore polluted spaces; genetic engineering of crops and livestock to improve their yield and nutrition etc. Odeyemi and Oyelami (2011) in their study on the knowledge, awareness and usage of molecular biology techniques as medical diagnostic tools among medical laboratory practitioners in Nigeria observed that most of these scientists are still ignorant of molecular techniques used in diseases prevention and control and therefore canvassed for timely exposure of laboratory scientists to molecular diagnostic skills. This study therefore focuses on knowing the level of awareness and application of molecular genetics techniques among agricultural science students in the University of Port Harcourt, Port Harcourt, Nigeria which can be projected for the southern part of the country.

MATERIALS AND METHODS

The knowledge and awareness of molecular genetics techniques among agricultural science students was tested using one hundred (100) students of the Faculty of Agriculture, University of Port Harcourt, Port Harcourt, Nigeria. A well structured questionnaire was designed and used for this purpose. The questionnaire was divided into three sections: the demographic structure of the students, their knowledge and awareness of molecular genetics techniques and their application of some of these techniques. Completed questionnaires were analyzed descriptive statistics: frequencies and percentages.

RESULTS

The gender and age groups of the students used in this study are presented in Table 1. 46% of the students were males while the remaining 54% were females. Nine percent (9%) of them are below 18 years while 75% of them fall between 18 and 25 years. 14% were between 26 and 36 years and only 2% were above 36 years. Table 2 shows the knowledge and awareness of the students on molecular genetics techniques. In considering the students knowledge and awareness about molecular genetics, 77% agreed that they were aware and 23% said they were not aware. Those aware got to know from lectures notes, seminars and workshops, internet and from their friends. On whether they are aware of some of the techniques used in molecular genetics, 56% agreed that they were aware of some of the molecular genetics techniques even if they cannot carry them out themselves while 44% were not aware. Some of the molecular techniques they have heard about included gene cloning (28%), Polymerase Chain Reaction (PCR) (8%), DNA sequencing (11%), Microsatellite DNA analysis (9%), Mitochondrial DNA analysis (20%) and Bioinformatics (7%). 17% of the students had no idea of any of these molecular genetics techniques.

The students' responses on the application of molecular genetics techniques are shown in Table 3. Only 41% agreed that they can handle some of the tools or equipments used in molecular genetics which ranged from the use of micropipettes, electrophoresis tank etc. 59% cannot handle any of these equipments. On the issue whether molecular genetics is relevant to the agricultural sector in Nigeria, all most all of the students (82%) agreed but 18% disagreed. This same trend was observed for the question "Has there being any improvement in plant and animal yield due to molecular genetics" where 89% percent agreed but 11% disagreed.

DISCUSSION

The results on the awareness are similar to those reported by Wideroff et al (2003) when they tested for the awareness of genetic testing for increased cancer risk in the year 2000 national health interview survey. The results are also in line with those reported by Odeyemi and Oyelami (2011) who showed that 45.9% of their respondents were aware of molecular biology techniques. 64.8% of them were satisfactorily aware of molecular biology techniques while 40.5% are familiar with genomic DNA extraction. 45.9% have heard of Polymerase Chain Reaction (PCR) while 17.5% had never heard of PCR and 54.1% had never seen a PCR machine.

Hunter et al (1998) while investigating the physician knowledge and attitudes towards molecular genetic (DNA) testing of their patients observed that a major proportion of physicians continue to rely upon undergraduate and medical school courses for knowledge, and the specialties showed different preferences for seeking information. A majority of physicians considered their knowledge of genetics to be adequate, but a minority was confident to provide genetic counseling for simple genetic scenarios. Relatively few had actually made use of DNA diagnostic services and there was relatively poor knowledge of what services were available. As revealed in their survey, Odeyemi and Oyelami (2011) emphasized that rightly and timely exposure of laboratory scientists and technologists in Nigeria and other parts of the world to molecular diagnostic skills will help detection, early prevention and treatment of diseases and infections. McGloughlin (1999) had stress ten reasons why biotechnology will be important to the developing world and the corresponding enlightenment of the masses especially in the developing world.

CONCLUSION

The growing trend in biotechnology and molecular genetics in particular necessitates a higher demand for scientists and technicians who are skilled in this area. Creating awareness of this field early enough among students will create the interest among them that will eventually lead to many of them aspiring to becoming skilled in these techniques. Provision of the basic molecular genetics equipment, organizing seminars and workshop on these techniques and modern trends will also help in promoting the spread of this field among Nigerians which will eventually lead to genetics improvement of plant and animal breeds in the country.

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Table 1: Demographic structure of agricultural science students used for this study

		Frequency	Percentage
Gender	Male	46	46.0
	Female	54	54.0
	Total	100	100.0
Age	Below 18 years	9	9.0
	18-25 years	75	75.0
	26-36 years	14	14.0
	Above 36 years	2	2.0
	Total	100	100.0

Table 2: Knowledge and awareness of molecular techniques

	Frequency	Percentage (%)
Have you heard about molecular genetics		
Yes	77	77.0
No	23	23.0
Total	100	100.0
Are you aware of some molecular genetics techniques		
Yes	56	56.0
No	44	44.0
Total	100	100.0
Which of these techniques are you familiar with		
Gene cloning	28	28.0
Polymerase Chain Reaction (PCR)	8	8.0
DNA sequencing	11	11.0
Microsatellite DNA analysis	9	9.0
Mitochondrial DNA analysis	20	20.0
Bioinformatics	7	7.0
None of the above	17	17.0
Total	100	100.0

Table 3: Application of molecular genetics techniques

	Frequency	Percentage (%)
Can you handle any of the equipments used for any molecular genetics techniques		
Yes	41	41.0
No	59	59.0
Total	100	100.0
Do you think molecular genetics is relevant to the agricultural sector		
Yes	82	82.0
No	18	18.0
Total	100	100.0
Has there being any improvement in plant and animal yield due to molecular genetics		
Yes	89	89.0
No	11	11.0
Total	100	100.0

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