Survey of fungal diseases associated with amaranth (Amaranthus species) in peri-urban vegetable farms in Kumasi and Tamale metropolis of Ghana

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Amaranthus species is an important leafy vegetable in Ghana; however, foliar diseases of the crop reduce the marketable and edible portions as well as income to farmers. To facilitate the development of disease management strategy, there is the need to document various diseases limiting amaranth production. In view of this, surveys were carried out in forty-three peri-urban vegetable farms in the Kumasi and Tamale Metropolis of Ghana to assess the prevalence and severity of fungal diseases associated with amaranth. Farms were selected using snowball pattern and on each farm, disease incidence and severity were assessed on 45 plants. Disease incidence for any particular fungal disease was calculated as number of plants showing symptoms compared to total number of plants selected whilst disease severity was rated as extent of tissue damage using a severity scale of 1-5. Survey results revealed anthracnose; stems cankers, wilting and wet rot as most prevalent diseases on amaranth. Wilting was the most frequent disease observed; occurring in 95% of farms visited whilst anthracnose, wet rot and stem canker were observed in 91%, 40 and 47% respectively of farms visited. Similarly, wilting disease incidence ranged from 13.3 to 51% across all locations compared to 13.3 to 58.3% for anthracnose, 11.9 to 61.7% for wet rot and 18.3 to 51.7% for stem canker. This work is among few investigations that had been made into diseases affecting the production of Amaranth in Ghana.

Key words: Disease symptoms, fungal foliar diseases, incidence, infection, severity

INTRODUCTION

Amaranthus species is one of the commonest indigenous vegetables grown in most tropical African countries. The crop, described as a poor man’s vegetable has been rediscovered as a promising food crop mainly due to its high nutritional value, resistance to heat, drought and low cost of production (Das, 2016). Both seeds and leaves of the crop are known for its excellent essential micronutrients such as beta-carotene, iron, calcium, vitamin C and folic acid (Chivenge et al., 2015; Mabhaudhi et al., 2019). The overall nutritional value of

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Amaranth is regarded significantly higher than several protein foods such as milk and soya bean and is therefore used as an important dietary supplement for HIV/AIDS patients in some African countries (Alemayehu et al., 2015). In addition, *Amaranthus* species has medicinal properties against constipation, fevers, hemorrhage, anaemia, kidney ailments and worms (Mensah et al., 2008; Koffuor et al., 2013). In Ghana, the crop is called “Aleefu” and commonly found in the Savannah, Deciduous and Forest agro-ecological zones (Dari et al., 2015). The crop plays significant role in the food security and income generation for farmers in both urban and rural settings. Despite its numerous importance, Awurum and Uchegbu, (2013), reported that production of Amaranth is greatly limited by pest and diseases. Vegetable Amaranth is susceptible to fungal diseases such as damping-off of seedlings caused by *Pythium*, *Rhizoctonia*, and *Aphanomyces* spp. and cankers caused by *Phoma* or *Rhizoctonia* (Stallknecht and Schulz-Schaeffer, 1993; Alemayehu et al., 2015). In Ghana, there is limited information on diseases associated with leafy Amaranth although there has been increase in the promotion of production and general usage of the crop (Darkwa and Darkwa, 2013; Asase and Kumordzie, 2019). This survey was therefore conducted to identify major fungal diseases of amaranth and determine the prevalence, incidence and severity of these diseases in peri-urban vegetable farms in Kumasi and Tamale Metropolis of Ghana. This information will guide future research on *Amaranthus* species.

**MATERIALS AND METHODS**

**Field sampling, climate, and soil type of study areas**

The surveys were conducted from July - August, 2019 at Kumasi and September - October, 2019 at Tamale to identify various fungal diseases of amaranth. Forty-three amaranth farms in peri-urban areas of Kumasi and Tamale Metropolis were selected using the snowball sampling technique where farms visited give directions to subsequent farms. Fifteen of the farms were in the Kumasi Metropolis (Figure 1) whilst 28 were in the Tamale (Figure 2). Kumasi Metropolis is in the Semi-Deciduous agro-ecological zone and is characterized by a tropical wet and dry climate with constant temperature of 24 - 26°C all year round. The area experiences bimodal rainfall pattern with a mean rainfall of about 1,400 mm per year (Drechsep and Keraita, 2014). Soil type of Kumasi metro is lateritic with sandy clay loam texture, and 12.25 CEC (cmol, kg⁻¹) that support production of vegetables such as amaranthus, cabbage, green pepper, carrot, spring onions, lettuce, and cabbage (Kwakye et al., 2004). Tamale metropolis is located in the Guinea Savannah agro-ecological zone and experiences a unimodal rainfall pattern around April/May to September/October. The area experiences an average rainfall of about 1,111 mm and an average annual temperature of about 27°C (Drechsep and Keraita, 2014). Soils in Tamale Metropolis are Ferric luvisol with sandy loam texture and 4.2 CEC (cmol, kg⁻¹) that support vegetables such as...
Amaranth, Onions, Melon, aubergine, lettuce, and Cabbage (Kwakye et al., 2004).

Disease incidence and severity assessment

Disease incidence and severity of amaranth were determined to assess the extent of disease spread in farms and the communities. Following a systemic field survey of foliar disease of amaranth; a total of 45 plants were selected in each farm using the Z-shape method (Manandhar et al., 2016). Two horizontal and 1 diagonal paths were made across the farms in Z-shape and along each path, 15 plants were assessed visually for expression of disease symptoms. For each farm, disease incidence was calculated as the number of plants infected, expressed as a percentage of the total number of total plants assessed (Manandhar et al., 2016).

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\text{Disease incidence (\%) = } \frac{\text{Number of plants infested}}{\text{Total number of plants assessed}} \times 100
\]

Disease severity (area of plant tissue or organ affected by the disease) was scored using a modified 1 – 5 rating scale and Barratt and Horstall percentage grading (Campbell and Benson, 1994). Disease severity was expressed as a percentage of the infected parts to total area plant part (Table 1) (Rao et al., 2016). Disease prevalence was determined as described by (Cooke, 2006). It is the disease incidence in a geographical area; thus if 30 farms in an area is inspected and 15 showed infection of particular disease, then prevalence for that disease is 50%.

Collection of disease specimen

Infected plant tissues of roots, stems or leaves showing symptoms of various diseases identified were collected from surveyed farms. Samples were placed in brown envelopes and brought to the laboratory for fungal identification.

Determination of mycoflora associated with amaranth roots, stems and leaves

Representative samples were cut to approximately 5 mm to contain both diseased and healthy tissues. The tissues were surface sterilized in 5% Sodium hypochlorite for 3 min, rinsed with sterile distilled water and dried under laminar hood. The dried tissues were placed on amended PDA and incubated for between 4 to 7 days at room temperature (28 ± 2°C). Standard identification manual (Barnett and Hunter, 1972) was used to identify fungal pathogens present on tissues under a compound microscope (SWIFT, USA).
The identification of the fungi was based on habit and morphological characters of the fruiting bodies on tissues and slides examination. Pure cultures of fungi growing in media were obtained from hyphal tips and identified (Ngegba et al., 2019).

**RESULTS**

**Symptoms of major fungal diseases associated with amaranth in the study area**

During the survey, four major fungal diseases namely anthracnose (plate 1), stems cankers (plate 2), wilting (plate 3) and wet rot (plate 4) were observed to be most prevalent diseases across the farms visited. Amaranth anthracnose symptoms appeared as brownish-red spots characterized by slightly sunken circular patterns.
surrounded by yellow halo with blights on leaves and dieback on plants. Stem cankers appeared as scars and openings on the stem. Plants showing wilting symptoms produced chlorotic leaves with dropping of leaves and seedlings. Wet rot disease showed water-soaked rot of stems and leaves covered with white hairy silk-like threads having black tips. The disease usually leads to the falling of affected parts.

Frequency of major fungal diseases associated with amaranth at Kumasi and Tamale metropolis

Results of the survey showed that wilting was the most frequently observed symptom recorded across the farms. Generally, 95% of farms surveyed had plants showing symptoms of wilts whilst anthracnose, stem canker, and wet rot disease symptoms were observed in 91, 37, and 46% of plants in surveyed farms (Figure 3).

Incidence and severity of wilting

Wilting and dropping of Amaranth plants with chlorotic leaves were observed in forty-one of the farms visited. The incidence of wilt ranged from 0 to 51% with significant difference ($P < 0.05$) among the farms (Table 2). Highest wilting incidence of 51.0% were recorded at Deduako F3 and Gambihene dam F4 in the Kumasi and Tamale metropolises respectively. The severity of wilting disease ranged from 1 to 4.22 (Table 3). This result indicates the disease caused 0 to 80% damage to Amaranth crops on the various farms surveyed. Mean incidence and severity of 23 and 50% respectively were recorded in Kumasi (Figure 4) whilst at Tamale, 32 and 38% respectively were recorded (Figure 5).

Incidence and severity of wet rot

Wet rot disease incidence ranged from 0 to 61.7% with significant difference ($P < 0.05$) among the farms. Twenty of farms visited recorded wet rot disease whilst the highest incidence at Emima F3 in the Kumasi metropolis (Table 2). Severity of wet rot ranged from 1 to 3.67 (Table 3) indicating disease damage ranging from 0 to 75%, which was higher in Tamale than Kumasi. Mean incidence and severity of 15 and 11% respectively were recorded in Kumasi (Figure 4) whilst 13 and 15% respectively were recorded at Tamale (Figure 5).

Incidence and severity of stem canker

Incidence of stem canker ranged from 0 to 51.67% with the highest incidence noticed at Emina F6 and Kakuo...
Table 2. Incidence of major fungal diseases associated with amaranth at Kumasi and Tamale metropolis.

| Metropolis | Farm                          | Anthracnose | Wilt  | Wet rot | Stem Canker |
|------------|-------------------------------|-------------|-------|---------|-------------|
| Kumasi     | Asokore Mampong F1            | 30.00       | 23.30 | 43.75   | 0.00        |
| Kumasi     | Asokore Mampong F2            | 15.00       | 18.00 | 0.00    | 25.00       |
| Kumasi     | Boadi                         | 28.30       | 18.70 | 0.00    | 0.00        |
| Kumasi     | Deduako F1                    | 38.30       | 21.70 | 31.67   | 0.00        |
| Kumasi     | Deduako F2                    | 16.67       | 13.30 | 20.70   | 21.67       |
| Kumasi     | Deduako F3                    | 13.33       | 51.01 | 0.00    | 45.70       |
| Kumasi     | Emina F1                      | 0.00        | 28.30 | 0.00    | 0.00        |
| Kumasi     | Emina F2                      | 15.33       | 28.30 | 0.00    | 28.33       |
| Kumasi     | Emina F3                      | 20.01       | 21.70 | 61.70   | 0.00        |
| Kumasi     | Emina F4                      | 2.00        | 0.00  | 0.00    | 0.00        |
| Kumasi     | Emina F5                      | 30.00       | 25.00 | 0.00    | 38.33       |
| Kumasi     | Emina F6                      | 58.30       | 33.70 | 0.00    | 51.67       |
| Kumasi     | Kentinkrono                   | 13.67       | 20.00 | 0.00    | 0.00        |
| Kumasi     | Tech Police station F1        | 14.33       | 21.70 | 0.00    | 39.37       |
| Kumasi     | Tech Police station F2        | 18.31       | 26.75 | 55.3    | 0.00        |
| Tamale     | Chogu larim                   | 13.67       | 20.00 | 0.00    | 0.00        |
| Tamale     | Chogu Lowcost F1              | 38.37       | 31.70 | 18.70   | 0.00        |
| Tamale     | Chogu Lowcost F2              | 38.33       | 50.00 | 31.33   | 0.00        |
| Tamale     | Chogu Lowcost F3              | 0.00        | 43.30 | 0.00    | 0.00        |
| Tamale     | Chogu Lowcost F4              | 15.00       | 25.00 | 0.00    | 38.33       |
| Tamale     | Chogu Mananyile F1            | 10.00       | 21.67 | 0.00    | 0.00        |
| Tamale     | Chogu Mananyile F2            | 38.33       | 36.67 | 44.50   | 36.67       |
| Tamale     | Chogu Nahirso F1              | 23.33       | 0.00  | 19.50   | 0.00        |
| Tamale     | Chogu Nahirso F2              | 0.00        | 28.00 | 0.00    | 18.33       |
| Tamale     | Chogu Nahirso F3              | 23.30       | 15.67 | 0.00    | 0.00        |
| Tamale     | Chugu Yapasi F1               | 20.00       | 31.67 | 16.20   | 0.00        |
| Tamale     | Chugu Yapasi F2               | 26.70       | 43.33 | 20.70   | 0.00        |
| Tamale     | Chugu Yapasi F3               | 24.67       | 33.28 | 0.00    | 0.00        |
| Tamale     | Chugu Yapasi F4               | 38.30       | 23.33 | 0.00    | 20.67       |
| Tamale     | Gambihene old/new dam F1      | 10.00       | 31.70 | 25.20   | 0.00        |
| Tamale     | Gambihene old/new dam F2      | 15.00       | 36.33 | 0.00    | 28.33       |
| Tamale     | Gambihene old/new dam F3      | 20.00       | 50.00 | 0.00    | 0.00        |
| Tamale     | Gambihene old/new dam F4      | 36.00       | 51.00 | 31.60   | 0.00        |
| Tamale     | Gambihene old/new dam F5      | 13.00       | 25.00 | 0.00    | 43.20       |
| Tamale     | Gambihene old/new dam F6      | 18.33       | 36.67 | 12.70   | 0.00        |
| Tamale     | Josnaoyile F1                 | 0.00        | 31.57 | 38.40   | 0.00        |
| Tamale     | Josnaoyile F2                 | 19.50       | 23.30 | 0.00    | 0.00        |
| Tamale     | Kakuo (Ghanasco dam)          | 49.67       | 31.70 | 11.90   | 51.57       |
| Tamale     | Sagani dam F1                 | 23.33       | 33.30 | 0.00    | 0.00        |
| Tamale     | Sagani dam F2                 | 23.37       | 23.30 | 16.70   | 30.00       |
| Tamale     | Sagani dam F3                 | 15.00       | 29.67 | 0.00    | 0.00        |
| Tamale     | Sagani dam F4                 | 30.00       | 47.50 | 0.00    | 0.00        |
| Tamale     | Sagani dam F5                 | 20.01       | 35.33 | 43.60   | 0.00        |
| l.s.d.     |                               | 4.289       | 3.822 | 4.79    | 5.157       |
| cv         |                               | 10.9        | 9.6   | 10.6    | 9.2         |

Source: Study

(Ghanasco dam) in the Kumasi and Tamale metropolis respectively (Table 2). Severity of tissue damage ranges from 1 to 3.33 (Table 3) indicating 0 to 50% damage of crops on the various farms surveyed. Mean incidence
Table 3. Severity of major fungal diseases associated with amaranth production at Kumasi and Tamale metropolis.

| Metropolis | Farm                        | Disease severity (%) |
|------------|-----------------------------|----------------------|
|            |                             | Anthracnose | Wilt | Wet rot | Stem Canker |
| Kumasi     | Asokore Mampong F1          | 2.83        | 4.03 | 1.67    | 1.00        |
| Kumasi     | Asokore Mampong F2          | 1.83        | 4.03 | 1.00    | 2.33        |
| Kumasi     | Boadi                       | 2.67        | 4.22 | 1.00    | 1.00        |
| Kumasi     | Deduako F1                  | 3.67        | 2.38 | 1.83    | 1.00        |
| Kumasi     | Deduako F2                  | 2.17        | 2.38 | 1.67    | 3.00        |
| Kumasi     | Deduako F3                  | 2.00        | 3.12 | 1.00    | 1.00        |
| Kumasi     | Emina F1                    | 1.00        | 2.02 | 1.00    | 1.00        |
| Kumasi     | Emina F2                    | 2.33        | 2.38 | 3.00    | 3.00        |
| Kumasi     | Emina F3                    | 2.67        | 2.38 | 2.50    | 1.00        |
| Kumasi     | Emina F4                    | 1.67        | 1.00 | 1.00    | 1.00        |
| Kumasi     | Emina F5                    | 2.50        | 4.03 | 1.00    | 2.17        |
| Kumasi     | Emina F6                    | 2.83        | 2.75 | 1.00    | 2.50        |
| Kumasi     | Kentinkrono                 | 2.33        | 2.38 | 1.00    | 1.00        |
| Kumasi     | Tech Police station F1      | 2.00        | 3.67 | 1.00    | 2.33        |
| Kumasi     | Tech Police station F2      | 2.17        | 4.03 | 2.67    | 1.00        |
| Tamale     | Chogu Larim                 | 2.00        | 2.57 | 2.00    | 1.00        |
| Tamale     | Chogu Lowcost F1            | 3.17        | 2.75 | 2.67    | 1.00        |
| Tamale     | Chogu Lowcost F2            | 3.00        | 3.12 | 3.17    | 1.00        |
| Tamale     | Chogu Lowcost F3            | 1.00        | 2.02 | 1.00    | 1.00        |
| Tamale     | Chogu Lowcost F4            | 1.83        | 2.38 | 1.00    | 2.50        |
| Tamale     | Chogu Mananyile F1          | 1.67        | 2.75 | 1.00    | 1.00        |
| Tamale     | Chogu Mananyile F2          | 3.00        | 3.30 | 1.83    | 2.17        |
| Tamale     | Chogu Nahisco F1            | 2.50        | 1.00 | 2.00    | 1.00        |
| Tamale     | Chogu Nahisco F2            | 1.00        | 2.02 | 1.00    | 2.17        |
| Tamale     | Chogu Nahisco F3            | 2.67        | 4.03 | 1.00    | 1.00        |
| Tamale     | Chugu Yapasi F1             | 2.17        | 4.03 | 3.00    | 1.00        |
| Tamale     | Chugu Yapasi F2             | 3.00        | 3.30 | 2.50    | 1.00        |
| Tamale     | Chugu Yapasi F3             | 2.83        | 2.57 | 1.00    | 1.00        |
| Tamale     | Chugu Yapasi F4             | 3.67        | 2.75 | 1.00    | 2.83        |
| Tamale     | Gambihene old/new dam F1    | 1.83        | 3.12 | 2.67    | 1.00        |
| Tamale     | Gambihene old/new dam F2    | 2.50        | 2.38 | 1.00    | 1.00        |
| Tamale     | Gambihene old/new dam F3    | 3.00        | 2.75 | 2.83    | 1.00        |
| Tamale     | Gambihene old/new dam F4    | 1.50        | 3.30 | 1.00    | 2.67        |
| Tamale     | Gambihene old/new dam F5    | 1.83        | 1.65 | 2.17    | 1.00        |
| Tamale     | Gambihene old/new dam F6    | 2.17        | 2.02 | 1.00    | 3.33        |
| Tamale     | Josaoyile F1                | 1.00        | 1.83 | 3.00    | 1.00        |
| Tamale     | Josaoyile F2                | 1.83        | 3.12 | 1.00    | 1.00        |
| Tamale     | Kakuo (Ghanasco dam)        | 3.83        | 2.02 | 2.67    | 2.17        |
| Tamale     | Sagani dam F1               | 2.33        | 2.75 | 1.00    | 1.00        |
| Tamale     | Sagani dam F2               | 2.17        | 3.3  | 3.67    | 2.83        |
| Tamale     | Sagani dam F3               | 2.17        | 2.57 | 1.00    | 1.00        |
| Tamale     | Sagani dam F4               | 2.83        | 2.93 | 1.00    | 1.00        |
| Tamale     | Sagani dam F5               | 1.83        | 4.03 | 3.67    | 1.00        |
| l.s.d.     |                             | 0.48        | 0.52 | 0.31    | 0.34        |
| cv         |                             | 12.8        | 12.3 | 10.7    | 13.4        |

Source: Study

and severity of 17 and 15% respectively were recorded in Kumasi (Figure 4) whilst Tamale recorded 10 and 9%
respectively (Figure 5).

**Mycoflora associated with amaranth roots, stems and leaves**

Nine genera of fungi viz., *Fusarium, Collectotrichum, Cercospora, Choanephora, Alternaria. Phoma, Cladosporium, Aspergillus and Penicillium* were isolated from leaves, stem and roots specimen showing symptoms of various diseases. Results of species composition (percentage) of fungi occurring on infected plant tissues are represented in Table 4. The most common organism isolated from leaves showing
## DISCUSSION

Disease survey in the study area observed anthracnose, stem cankers, wilting and wet rot as prominent diseases in amaranth farms. Diseases such as wet rot, anthracnose, white rust, leaf spots, root rot wilting and damping off on seed beds have been reported in amaranth fields in Africa and other continents (Blodgett and Swart, 2002; Pusz et al., 2015; Manandhar et al., 2016; Nampeera et al., 2019). Anthracnose and shoot dieback diseases of amaranth in West African was reported by (Sullivan, 2003). Ebert et al. (2011) reported of anthracnose on amaranth in Taiwan and concluded that the disease could become a serious problem in many countries hence breeding for resistance cultivars is urgent. Wilting of vegetables due to seed infections and soil-borne fungi particularly *Fusarium* species is common in the sub-region (Abang et al., 2002). *Fusarium* wilt of amaranth was reported in South Africa (Blodgett et al., 1998; Blodgett and Swart, 2002). In their report, over 72% incidence of wilting and severe damage of the disease on amaranth occurred in South Africa. Wet rot is a common foliar disease in most amaranth fields worldwide (online /PlantHealth/Crops/Amaranth, 2020). The disease has been devastating in Nigeria, Tanzania and Cameroon and South Africa (Abang et al., 2002). In Nigeria, Awurum and Uchegbu, (2013) reported of up to 50% yield loss of amaranth production in due to wet rot disease, thus presence of the disease put production of the crop at risk. Incidence and severity of the diseases showed in the study were high with significant difference in levels of infection among the locations. Variations in disease incidence and severity of Amaranth diseases recorded at the various locations is a in conformity with (Zahidul Islam, 2019). Higher disease incidences and severities in the fields could be attributed to a host of factors. Weather conditions, soil type, type of cultivar and cultural practices contributes to the occurrence and multiplication of diseases in the field. Foliar diseases on vegetable amaranth often reduces the aesthetic values of the crops and negatively affect marketability of the leaves (Krishnakumary and Rajan, 2006; Zahidul Islam, 2019). Again, the high severity of these diseases implies that quantity and quality of the edible leaves are reduced. Reduction of crop quality, yield and market value due to diseases gives indication that income of farmers is compromised (Cerda, 2017). Highest incidence of all the diseases in the farms was observed in Kumasi metropolis, in the Semi-deciduous forest zone. This could be related to the high rainfall and relative humidity with warm temperatures recorded in the zone. According to Sree et al (2010) and Shanaz et al. (2015), the occurrence, severity, spreading and infection cycles of disease like Anthracnose, damping-off, wet rot and Fusarium rot are affected by amount of rainfall and relative humidity hence these diseases are common and severe in areas with heavy rains. Presence of these diseases in majority of Amaranth growing areas is most likely because of inappropriate cultural and agronomic practices such as the lack of proper field sanitation which could result in high inoculum density in the environment or the use of infected seeds. Nine genera of fungi were isolated and identified on Amaranth disease specimen and these fungi have proven to be antagonistic on

### Table 4. Percentages of fungi isolated from infected plant tissues.

| Disease     | Plant part | Fusarium Spp. | Colletotrichum Spp. | Choanephora Spp. | Cercospora Spp. | Phoma Spp. | Alternaria Spp. | Aspergillus flavus | Aspergillus niger | Cladosporium Spp. | Penicillium Spp. |
|-------------|------------|---------------|---------------------|------------------|----------------|-----------|----------------|-------------------|-----------------|-----------------|-----------------|
| Anthracnose | Leaf       | 1             | 61                  | 2                | 2              | 1         | 2              | 5                 | 2               | 2               | 2               |
| Stem canker | Stem       | —             | 59                  | 1                | —              | —         | —              | 5                 | 5               | 3               | —               |
| Wet rot     | Leaf, stem | —             | —                   | 85               | —              | —         | —              | —                 | —               | —               | —               |
| Wilt        | Root       | 55            | —                   | —                | 2              | 2         | —              | 5                 | 5               | 2               | 2               |

— Organism not isolated.

Source: Study
Amaranth. Choanephora species are known to cause wet rot; the most destructive disease of Amaranth species (Sullivan, 2003; Awurum and Uchegbu 2013). According to Blodgett et al. (2002), Fusarium species are associated with wilting and damping-off diseases of amaranth in the field. Phoma, and Alternaria species have been isolated as the causal agents of stem cankers and leaf spots in amaranth fields (Stallknecht and Schulz-Schaeffer, 1993). Colletotrichum species are known as the causal agent of anthracnose in amaranth (Manandhar et al., 2016).

To the best our knowledge, this study is the first report on the incidence and severity of fungal diseases affecting amaranth as well various fungal pathogens associated with the diseases in Ghana.

**CONCLUSION**

Results of the current study have identified wilts anthracnose, stem canker, and wet rot as the common diseases associated with amaranth in the Kumasi and Tamale Metropolises. Ninety-five percent of farms surveyed had plants showing symptoms of wilts whilst anthracnose, stem canker, and wet rot disease symptoms were observed in 91, 37, and 46% of plants in surveyed farms. High disease incidence and severity of damage crop tissues were noticed in the fields surveyed. Highest incidence of the diseases was observed in Kumasi metropolis. This result is crucial to Amaranth production in the two Metropolises of Ghana. Further work should be conducted in other amaranth growing communities in Ghana to assess fungal diseases occurring in the fields for appropriate management to be undertaken.

**CONFLICT OF INTERESTS**

The authors have not declared any conflict of interests.

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