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THE SEEDLING GROWTH RESPONSE OF *PISUM SATIVUM* L. TO DIFFERENT TYPES OF COMPOST

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ABSTRACT. The constant increase in the high number of population, anthropogenic and industrial activities are alarming issues and raise food security issues around the world. The treatment of compost acts as an effective and environmentally friendly tool for an increase in vegetable production. This research article records the effects of three soil compost treatments (1) dry leaves (*Ficus bengalensis* L.), (2) solid waste (mustard oil cake) and (3) chicken manure, alone and in combination, with seedling growth performances of pea in pot culture experiments with five replications. The results showed that soil compost treatments showed a significant ($p < 0.05$) impact on the physicochemical features of soil and the physiological characteristics of pea (*Pisum sativum* L.). Soil compost analysis revealed a difference in soil porosity and pH, electrical conductivity, organic matter, total organic carbon, $CaCO_3$, Na^+, K^+, phosphorous and nitrogen. Plant tissue analysis of pea seedlings also showed different levels of sodium, potassium and phosphorous values. The findings of the present research work concludes that the treatment of *F. bengalensis* dry leaves (25%) + garden loam (75%) treatment produced maximum growth performance, and the mustard oil cake solid waste (25%) + garden loam (75%) treatment showed the lowest seedling growth performance. The *F. bengalensis* dry leaves (25%) + garden loam (75%), soil compost application treatment showed the maximum seedling height of pea. The solid waste (SW) mixed with garden loam (GL) (SW 25% + GL 75%) and mustard oil cake solid waste alone treatment showed the lowest seedling growth of pea. The *F. bengalensis* dry leaves 25% + garden loam 75% compost treatment also influenced on the soil properties.

Keywords: Compost; *Ficus benglensis*; garden loam; organic matter; pea.

INTRODUCTION

The use of compost enhances the soil's ability to hold water, promotes plant growth, reduces the risk of soil-borne illnesses, and offers a steady supply of nutrients (Noble and Coventry, 2005; Lazcano and Domínguez, 2011). Compost treatment plays an important role in nutrient and crop management effectively. Compost helps in improving the properties of soils and the quality of the environment (Ozores-Hampton *et al.*, 2022). Solid compost waste affects microbiological seed germination and plant growth (Guerrero *et al.*, 2000; Certini, 2005; Paradelo *et al.*, 2012). The addition of compost, such as municipal solid waste, improves vegetation cover due to macronutrient dynamics (Guerrero *et al.*, 2001). Poultry manure has also been used for plant cultivation (Vázquez *et al.*, 1996). Healthy soils with compost provide a suitable habitat for plants (Heyman *et al.*, 2019). Compost application showed diverse effects on potato yield in agriculture fields due to increased soil organic content and soil productivity (Wilson *et al.*, 2019). Chicken manure compost regulates phytotoxicity with the treatment of biochar (Wang *et al.*, 2022).

With the decomposition of the organic material, compost favors increase soil organic matter concentrations, water retention, weed control, and long-term nutrition supply (Evanylo and Daniels, 1999) and application of compost can improve crop production to some extent. The quality of compost is determine by its products of ability and capacity to perform its intended function (Stehouwer *et al.*, 2022). The unique phyisco-chemical properties of three different types of compost showed beneficial and harmful effect on seedling growth of pea. The composting is a main technological pathway through which manure is transformed into organic fertilizer is composting (Zhang *et al.*, 2023). There are different types of compost available from different sources and used to increase crop production. Chicken manure is an organic fertilizer that contains a significant amount of nutritional element, a source of antibiotic resistance gene and pathogenic microbe and vital source used in agriculture for macro and micro element for plant growth (Abdellah *et al.*, 2023; Wu *et al.*, 2023). The animal manure and allelopathic potential of different parts of plants found helpful for plant growth.

Pea (*Pisum sativum* L.) is a leguminous vegetable seed crop for food industry and human nutrition as a source of protein increase body weight (Athar and Bokhari, 2005; Richard *et al.*, 2015; de Castro *et al.*, 2019; Abi-Melhem and Hassoun, 2023). The high percentage and increase in the use of chemical fertilizer is affecting crop production. Researchers have been working on the use of poultry manure, plant litter and solid waste compost as alternate sources of fertiliser to rapidly increase crop production in the last couple of decades in developed countries. The information about the effects of poultry, solid waste and plant litter compost on pea, an important crop in Pakistan, is scanty. This investigation aimed to records the impact of selected compost on seedling development, biomass production and some nutrient content of *P. sativum*. Additionally, the role of these three composts on the edaphic characteristics was also determined. The pea crop was selected for this experiment because this crop is widely grown in the northern and southern parts of the Punjab province of Pakistan and is supporting a positive role in the agroindustry.

MATERIALS AND METHODS

Sample collection and preparation

Three different types of compost were used. Dry leaves of *Ficus bengalensis* L. were collected from a tree near to Agriculture Research Institute, University of Karachi, Karachi-Pakistan. The rape seed oil solid waste, also known as mustard oil cake (brassica-mustard-straw) was obtained from a local superstore. The chicken manure was collected from a local poultry farm. The leaves of *F. bengalensis* and rape seed oil solid waste were crushed in a grinder. The seven different types of soil compost compositions were evaluated in the following ratios for treatment.

T1: *F. bengalensis* dry leaves (25%) + mustard oil cake solid waste (25%) + garden loam (50%)

T2: *F. bengalensis* dry leaves (25%) + garden loam (75%)

T3: *F. bengalensis* dry leaves (25%) + chicken manure (25%) + garden loam (50%)

T4: *F. bengalensis* dry leaves (25%) + chicken manure (25%) + mustard oil cake solid waste (25%) + garden loam (25%)

T5: Mustard oil cake solid waste (25%) + garden loam (75%)

T6: Mustard oil cake solid waste (25%) + chicken manure (25%) + garden loam (50%)

C: Garden loam (without compost) control

Seedling growth experiment

The seedling growth experiment was carried out in the greenhouse of the Department of Botany, University of Karachi, Karachi-Pakistan, under uniform natural environmental conditions. The maximum and minimum temperatures during the experiment were 22–31°C and 11–18 °C. The atmospheric humidity was 14–88%, and the weather outlook was in the range of 10:30–11:41 hours of sunshine. Healthy and uniform size seeds of pea plants were taken from the Memon Goth, Malir Karachi, agriculture field. The obtained seedlings were planted after 3 weeks in pots with a diameter of 7.3 cm and a height of 9.6 cm in seven different soil compost ratios. One pea seedling was grown in each pot and watered every day with tap water. The design of the experiment was completely randomised. There were five replicates for each treatment. Every week, pots were moved to avoid the effects of sun, shade, or any other greenhouse factor. After four weeks, seedlings were carefully uprooted from the pots and washed thoroughly to records the root, shoot, seedling length and number of leaves. The root, shoot and leaves were separated and dried in an oven at 80 °C for 24 hours to get dry weight. The percentage of tolerance and toxicity to soil compost (Tolerance Indices (TI)) was calculated as per the following *Equation (1)*:

$$TI = \frac{mean\ root\ length\ in\ soil\ compost\ treatment}{mean\ root\ length\ in\ without\ soil\ compost\ treatment} \times 100 \quad (1)$$

Physical analysis of soil

The compost treated soil sample was air-dried to ensure a uniform sample and passed through a 2.0 mm sieve to remove large particles. The maximum water-holding capacity percentage of soil and porosity (%) was done by the method of Keen (1931) and Matko (2003). The bulk density was calculated according to Birkeland (1984).

Chemical analysis of soil

Calcium carbonate percentage was determined by the acid neutralisation method (Qadir *et al.*, 1966), and soil pH was measured by a direct pH reading meter (MP 220). Using the conversion factor of 1.724, organic matter was expressed into total organic carbon. Exchangeable sodium and potassium in soil were also determined by the method of Richards (1954). Soil electrical conductivity and total dissolved salts (TDS) were determined by using a conductivity reading meter (AGB 1000). The total phosphorous in treated soil was establish according Olsen and Sommer (1982). The per cent nitrogen in seedlings was determined by method of standard official methods of analysis (AOAC 2005).

Statistical analysis

Duncan's Multiple Range Test was used where appropriate for mean separations at $p < 0.05$ probability level using COSTAT version 3 statistical analysis software.

RESULTS AND DISCUSSION

The use of compost is of great concern to improve crop productivity. It helps in improving the fertility of the soil. There are different types of compost available from different sources and used in urban green areas (Sæbø and Ferrini, 2006; Paradelo *et al.*, 2010; Heyman, 2019), which helps the improvement of crop production. The treatment of three selected different types of compost, 1-[mustard oil cake solid waste - brassica-mustard- straw (SW), 2-chicken manure (CM) and 3-dry leaves (DL) of *Ficus bengalensis* L.)] alone and in a mixture with different concentrations affected the seedling growth performance of pea (*Figure 1, Figure 2, Figure 3, Table 1, Table 2, Table 3*).

In the present research, the soil compost treatment T1-T6 produced varying effects on seedling growth performances of pea seedlings compared to without soil compost treatment (control). In the present research, the solid waste (SW25% + GL75%) mustard oil cake solid waste only treatment significantly showed the lowest root, shoot, seedling height and leaf number of pea (*Figure 1*).

The variable growth response of pea seedlings to different compost treatments depended on their ability to withstand environmental stresses. Similarly, Purves *et al.* (1973) found severe phytotoxic effects on beans, peas and potato yields with compost treatment.

The addition of *F. bengalensis* dry leaves 25% alone produced the greatest seedling height and number of leaves of pea among the treatments. The combined application of *F. bengalensis* dry leaves (25%) + chicken manure (25%) and (50%) garden loam compost slightly increased the shoot length and seedling height of pea. The treatment of *F. bengalensis* dry leaves (25%) + chicken manure (25%) + solid waste (25%) and (25%) garden loam compost at an even level further decreased the seedling growth characteristics of pea.

The treatment with different types of compost and absorption of nutrients can be an important reason for variation in the pea seedling growth performance and agree with the findings of other researchers. The relationship between different soil characteristics with plant growth is documented in the scientific literature (Bonanomi and Mazzoleni, 2005). The seedlings of pea plants grown in chicken manure compost were less healthy, smaller in size and had fewer leaves than the *F. bengalensis* dry leaves and solid waste compost treatment. The solid waste treatment produced the significantly ($p < 0.05$) highest root length of seedlings. The root lengths were more affected by the concentration of the compost and the uptake of metals (Öncel *et al.*, 2000; Araujo and Monteiro, 2005).

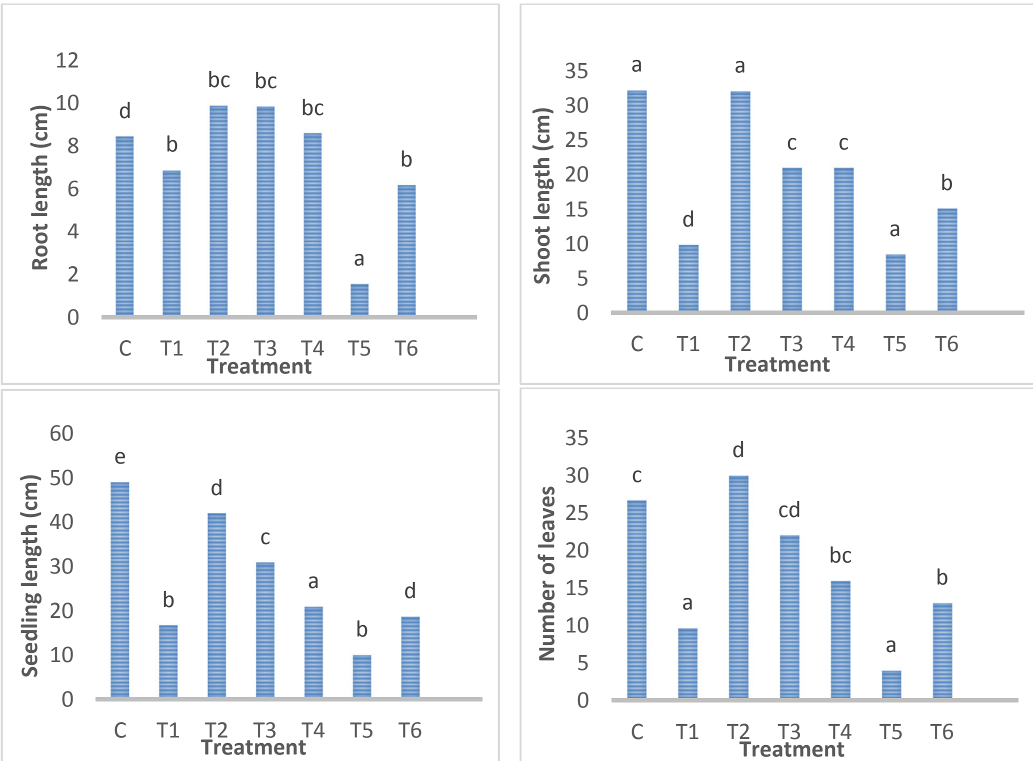

Figure 1 – Effects of different types of soil compost on different seedling growth attributes of pea seedlings

Different alphabets on the bar indicate significantly different ($p<0.05$) among treatments according to Duncan's Multiple Range Test: symbol used: C = control (GL = garden loam soil 100%); T1 = DL25% + SW25% + GL50%, T2 = DL25% + GL75%, T3 = DL25% + CM25% + GL50%, T4 = DL25% + CM25% + SW25% + GL25%, T5 = SW25% + GL75%, T6 = SW25% + CM25% + GL50%; SW = solid waste sarson ki khali (brassica-mustard- straw), CM = chicken manure, DL = dry leaves (*Ficus bengalensis* L.)

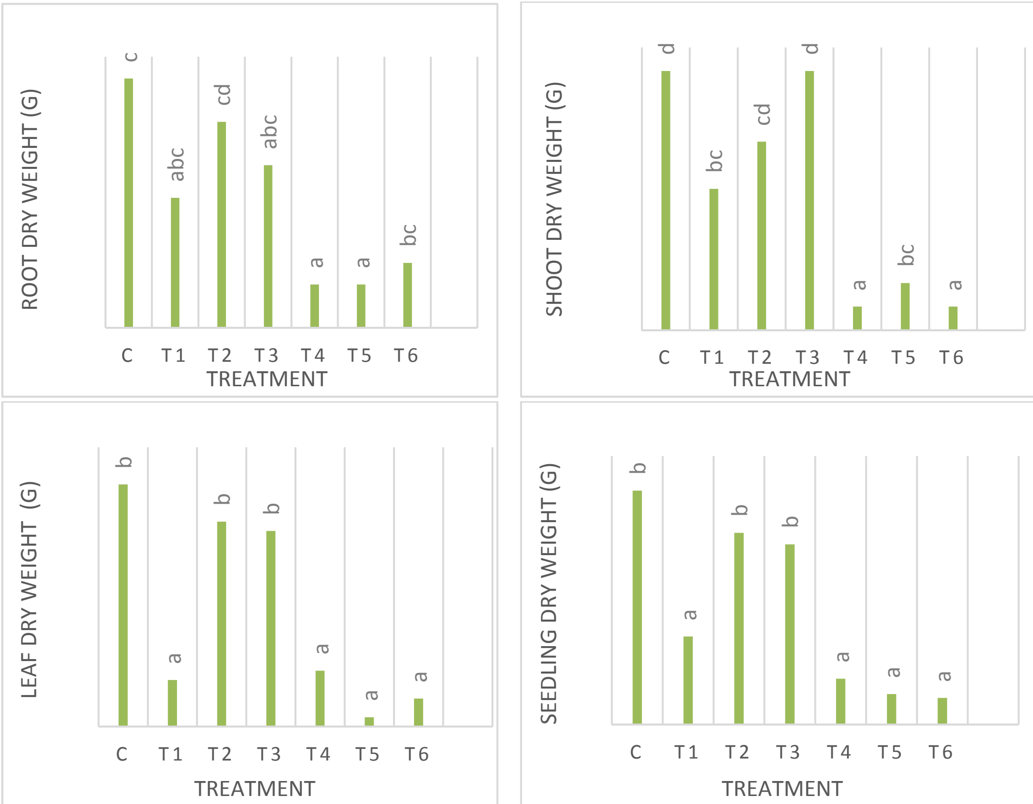

Figure 2 – Effects of different types of soil compost on the root, shoot, leaves and seedling dry weight of pea seedlings

Values followed by the same letters on the same bar are not significantly different ($p<0.05$) according to Duncan's Multiple Range Test; abbreviation for soil compost treatment (C, T1, T2, T3, T4, T5, T6), see Fig. 1

The difference in the percentage of tolerance indices of pea seedlings in different types of compost soil was also recorded (*Figure 3*). The dry leaves of *F. bengalensis* (25%) alone and with chicken manure (25%) soil compost treatments showed the best seedling tolerance indices (%) for pea seedlings. The mustard oil cake solid waste treatment (25%) highly decreased the tolerance indices percentage in pea seedlings as compared to the control (*Figure 3*). Crop production faces different types of abiotic stress challenges (Adejumo *et al.*, 2020). The tolerance indices of pea seedlings from the maximum to the minimum in the order of soil compost treatment were T2> T3> T4> T6> T1> T5. The tolerance indices of pea seedlings for different types of compost treatment responded differently. The lowest reduction (17.15%) in the tolerance indices of pea was recorded for T5 = SW25% + GL75% compared to the control. The average seedling tolerance indices (%) of pea gradually decreased for T2 (117.16%), T3 (116.68%), T4 (101.77%), T1 (81.18%) and T6 (73.01%).

Compost treatment usually benefits the quality of the soil. The treatment of solid waste - sirson ki khali - brassica-mustard-straw (SW), chicken manure (CM) and dry leaves (DL) of *Ficus bengalensis* L.)] alone and in a mixture with different concentrations (%) affected the physical and chemical properties of compost-treated soil (*Table 1, Table 2*).

The soil compost treatment of *F. bengalensis* (25%) + solid waste (25%) + garden loam (50%) showed the highest maximum water holding capacity (WHC) of soil (%) (Table 1). The results of the present research work showed the highest maximum water-holding capacity of the soil (82.18%), with the *F. bengalensis* dry leaves (25%) + solid waste (25%) + garden loam treatment as compared to control (42.37%). A better percentage of water holding capacity of the soil was observed in soil samples treated with *F. bengalensis* dry leaves + garden loam, DL + CM + garden loam and SW + garden loam.

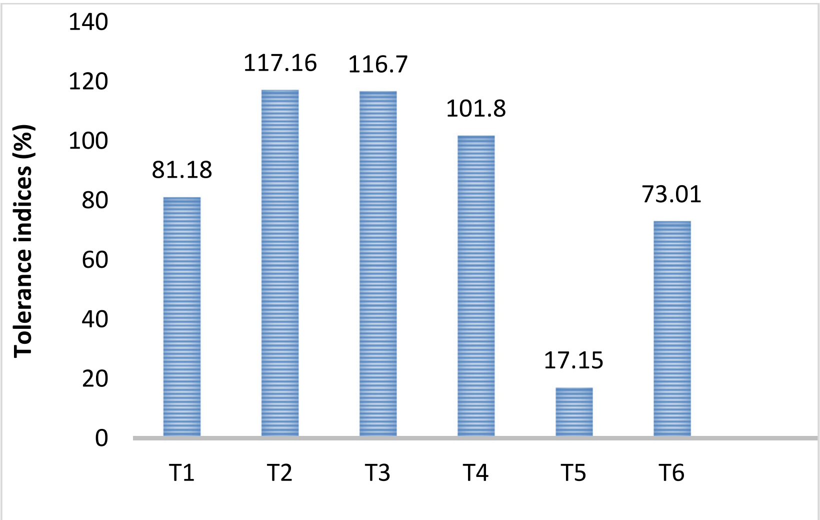

Figure 3 – Different soil compost treatments

Table 1 – The physical characteristic of the different soil compost and garden loam

Treatment	Maximum water holding the capacity of the soil (%)	Bulk density (g cm^{-3})	Porosity (%)
C	42.37a ± 0.19	1.54e ± 0.01	41.69a ± 0.12
T1	82.18e ± 0.55	1.54b ± 0.00	56.28bc ± 0.36
T2	73.31d ± 1.49	1.08a ± 0.02	59.18c ± 0.81
T3	65.94c ± 1.20	1.21bc ± 0.04	53.68b ± 2.16
T4	78.63e ± 0.0	1.07a ± 0.00	59.62d ± 0.00
T5	55.81b ± 3.08	1.36d ± 0.01	48.48a ± 0.58
T6	63.72c ± 0.51	1.27c ± 0.00	54.17b ± 0.00

Symbol used: T1 = DL25% + SW25% + GL50%, T2 = DL25% + GL75%, T3 = DL25% + CM25% + GL50%, T4 = DL25% + CM25% + SW25% + GL25%, T5 = SW25% + GL75%, T6 = SW25% + CM25% + GL50%; SW = solid waste sarson ki khali (brassica-mustard- straw), CM = chicken manure, DL = dry leaves (*Ficus bengalensis* L.) C= Control.

Table 2 – Chemical characteristics of the different soil compost and garden loam

Soil Parameters	Soil Compost Treatment						
	C	T1	T2	T3	T4	T5	T6
pH	4.85c ± 1.50	7.47c ± 0.05	7.55c ± 0.07	6.64a ± 0.02	6.49a ± 0.01	6.61a ± 0.09	7.17b ± 0.09
EC (mS/m)	1.30c ± 0.00	0.90a ± 0.00	0.80a ± 0.00	1.10b ± 0.00	1.70b ± 0.00	1.20bc ± 0.00	1.65bd ± 0.07
TDS %	0.85d ± 0.05	0.60ab 0.00	0.50a ± 0.00	0.70bc ± 0.00	1.10d ± 0.00	0.80c ± 0.00	1.10d ± 0.00
OM (%)	3.45a ± 0.05	34.0d ± 3.50	21.0bc ± 5.50	8.25a ± 0.75	25.85cd ± 0.65	19.75bc ± 3.25	35.50d ± 0.05
Total OC (%)	1.71a ± 0.32	19.74d ± 2.05	12.18bc ± 3.19	4.79a ± 0.43	14.98cd ± 0.38	11.41bc ± 1.93	0.55d ± 0.25
$CaCO_3$(%)	21.10a ± 0.65	73.50a ± 6.27	14.10a ± 1.90	13.40a ± 1.60	13.10a ± 1.90	15.80a ± 4.80	4.50b ± 2.50
Sodium (µg/g)	788d ± 48.00	325b ± 25.00	155a ± 5.00	120a ± 0.00	330b ± 30.0	160a ± 0.00	160a ± 0.00
Potassium (µg/g)	1210d ± 50.00	487.5b ± 12.50	310a ± 50.00	475a ± 25.00	785c ± 35.00	164a ± 4.00	250a ± 25.00
Phosphorous (µg/g)	10.60bc ± 0.30	8.14b ± 0.56	1.19a ± 0.05	7.77b ± 0.77	11.25bc ± 1.05	8.37b ± 3.03	14.61c ± 0.99
Nitrogen (%)	3.97d ± 0.05	7.66f ± 0.46	0.73a ± 0.05	2.94c ± 0.0	1.41ab ± 0.34	1.91b ± 0.05	1.17a ± 0.10

Symbol used: T1 = DL25% + SW25% + GL50%, T2 = DL25% + GL75%, T3 = DL25% + CM25% + GL50%, T4 = DL25% + CM25% + SW25% + GL25%, T5 = SW25% + GL75%, T6 = SW25% + CM25% + GL50%; SW = solid waste mustard oil cake (brassica-mustard- straw), CM = chicken manure, DL = dry leaves (*Ficus bengalensis* L.) C= Control. OM = organic matter; TDS = total dissolved salts; millisiemens per meter (mS/m).

The lowest bulk density value (1.07 g/cm^3) was recorded in a soil sample of *F. bengalensis* dry leaves (25%) + solid waste (25%) + chicken manure (25%) + garden loam (25%) soil compost as compared to control (1.54 gm/cm^3). The soil's physical factors, such as bulk density and soil strength, affected the root growth of pea seedlings (Pabin *et al.*, 1998). However, in this study, the highest bulk density value in chicken compost strongly favoured the pea seedling size. The application of solid waste - sirson ki khali - brassica-mustard-straw at (25%) did not produce any significant difference in soil porosity (%) as compared to the control. A high percentage of soil porosity (59.62%) was recorded in the soil sample of *F. bengalensis* (25%) + chicken manure (25%) + solid waste (25%) and garden loam (25%) compost, and the lowest (41.69%) was recorded in the control.

The changes in edaphic character change the growth performance of plants. The soil compost treatment prominently influenced the chemical properties (pH, EC, TDS%, organic matter (%), total organic carbon (%), calcium carbonate (%), sodium (µg/g), potassium (µg/g), phosphorous (µg/g) and nitrogen (%)) of soil. The *F. bengalensis* dry leaves (25%) + garden loam (75%) compost treatment showed high pH, low EC, TDS and P compared to all other types of compost treatment (Table 2). Compost improves the physical and chemical properties of soil, including salinity levels, and ensures the presence of cations and anions, which are required for plant growth (Zmora-Nahum *et al.,* 2007). The high salt content in chicken manure compost decreased the number of leaves of pea recorded. The effects of soil compost and total dissolved salts on the yield and seedling growth of pea were recorded. The electrical conductivity of 24.9 dS m^{-1} produced no grain in pea or dry beans (Steppuhn *et al.*, 2001).

The soil compost treatment showed a pH value in the range of 4.85–7.55. The soil compost treatment (T2) produced higher soil pH (7.55), and a similar increase in soil pH was recorded by another researcher. The application of compost increased soil pH and increased *Theobroma cacao* L. growth (Doungous *et al*., 2018). Duzdemir *et al*. (2009) recorded the best yield of pea at pH 6.5–7.0. Soil compost treatment (T5) significantly decreased seedling growth of pea seedling growth, which might be due to physiological, metabolic and biological changes. High concentrations of sodium in the soil solution negatively affected potassium uptake and decreased the productivity and growth of tomato seedlings (Baghour *et al.*, 2023).

Plant tissue analysis helps in improving and understanding the demands of particular crops. Tissue analyses were also made for sodium, potassium and phosphorous. The significance values of sodium, potassium and phosphorous contents of pea seedlings with different types of compost treatment were recorded. The amount of sodium was relatively low in the *F. bengalensis* dry leaves (25%) + garden loam (75%) treatment. The amount of phosphorus and potassium was significantly lower for the *F. bengalensis* dry leaves (25%) + solid waste (25%) + chicken manure (25%) + garden soil (25%) treatment. The level of sodium, potassium and nitrogen in the pea seedlings showed variation and was dependent upon the compost treatment. The contents of sodium, potassium and nitrogen in pea seedlings were high in the chicken manure treatment and followed by the *F. bengalensis* dry leaves compost. In the *F. bengalensis* dry leaves + garden compost, the amount of organic matter (%) was good, which is beneficial for plant growth, and the leaf compost also increased the humic substances, which caused a positive increase in the fruit yield.

The application of 25% *F. bengalensis* dry leaf soil compost improved Na^+ (12.5 µg/g), K^+ (38.50 µg/g) and P (102.50 µg/g) in pea seedlings compared to other treatments (*Table 3*).

The phytochemical constituents of the leaves of *Ficus* species provide an opportunity for pharmaceutical industries (Dutta *et al.*, 2022). The treatment of solid waste application with 25% *F. bengalensis* dry leaf soil compost improved Na^+ (12.5 µg/g), K^+ (38.50 µg/g) and P (102.50 µg/g) in pea seedlings as compared to other treatments. The treatment of *F. bengalensis* dry leaves, chicken manure and solid waste at 25% showed average Na^+ (15.25 µg/g) and K^+ (25.55 µg/g) and the lowest P (55.0 µg/g) contents in pea seedlings compared to other treatments. The compost contains dry leaves of *F. bengalensis* with garden loam and chicken manure, presenting good growth in peas, as it resulted in low Na^+ and high levels of P in pea seedlings.

Table 3 – Physiological analysis of *Pisum sativum* plant material grown in different soil compost

Soil parameters	Soil compost treatment						
	C	T1	T2	T3	T4	T5	T6
Sodium (µg/g)	13.5abc ± 0.0	17.25d ± 0.25	12.50a ± 0.50	17.5d ± 0.50	15.25c ± 0.25	12.5a ± 1.0	14.75bc ± 0.25
Potassium (µg/g)	37.04c ± 0.04	22.50a ± 0.50	38.50c ± 0.50	37.7c ± 0.25	25.55b ± 0.05	25.0ab ± 0.0	24.10ab ± 0.60
Phosphorous (µg/g)	105cd ± 5.00	112.5e ± 2.50	102.5e ± 2.50	113.5e ± 3.50	55.0a ± 0.0	87.5c ± 2.50	67.50b ± 2.50

Symbol used: T1 = DL25% + SW25% + GL50%, T2 = DL25% + GL75%, T3 = DL25% + CM25% + GL50%, T4 = DL25% + CM25% + SW25% + GL25%, T5 = SW25% + GL75%, T6 = SW25% + CM25% + GL50%; SW = solid waste mustard oil cake (brassica-mustard- straw), CM = chicken manure, DL = dry leaves (*Ficus bengalensis* L.) C= Control. ± standard error.

The amount of phosphorus was found to be prominently high by the physiological test of plant materials growth in the DL + garden loam and DL + CM + garden loam compost treatments. The treatment of composted chicken manure material which has high contents of minerals like nitrogen, and phosphorus had a slightly basic pH, good porosity, better maximum (WHC) of soil and less amount of calcium carbonate could be the possible reasons for the increase of seedling growth performances of pea. The value of nitrogen content in the legume plant tops increased with the phosphorus supply (Andrew and Robins, 1969). Similarly, Zubiriski and Zimmerman (1969) found that nitrogen has a relatively large effect on seed yield in the physiological analysis of plants grown in chicken manure compost, as high nitrogen content and adequate amounts of phosphorus, sodium and potassium balance were found in CM + DL + garden loam and M + garden loam compost. Nitrogen and phosphorous are important elements and play a crucial role in plant growth and productivity. The incorporation of C and N compounds into soil and uptake by plants has been reported (Nogués *et al.*, 2023). Similarly, in another study, the root morphology and plant height were significantly affected by the treatment of N and P in four years of seedlings of *Acer mono* (Razaq *et al.,* 2017).

CONCLUSIONS

It was concluded that the soil compost treatment process containing dry leaves of *F. bengalensis* (25%) + garden loam (75%) is an effective tool and showed the best seedling growth of pea. The chemical characteristics of dry *F. bengalenses* leaves (25%) + garden loam (75%) compost-treated soil showed high soil pH (7.55), average E.C. (0.80 mS/m), and TDS. (0.50%), OM (21.0%), total OC (12.18%), $CaCO_3$ (14.10%), Na^+ (155 µg/g) and K^+ (310 µg/g), along with the lowest P (1.19 µg/g) and N (0.73%). The soil compost treatment with 25% solid waste - mustard oil cake solid waste (brassica-mustard-straw) + garden loam (75%) showed the lowest pea seedling growth performance.

Author Contributions:
MZI conceptualisation; supervision; BJ methodology, data collection; MS writing manuscript, data analysis, literature survey;

MA review the manuscript draft and approved the publication of the manuscript in this present form.

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