

BG-11 and Bold Basalin Food Environments B. Braunii-Andi-115 Andch. Infusionum-Growth of Andi-76 Strains

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Abstract: BG-11 in the article in nutrient media B. braunii-AnDI-115 and Ch. infusionum- from the study of the effect of AnDI-76 strains on growth, biomass and pigment formation in relation to dry matter consists of

Keywords: B. braunii-AnDI-115 and Ch. infusionum-AnDI-76, BG-11, Chlorella vulgaris, Spirulina platensis, Haematococcus pluvialis and Dunaliella salina.

In research B. braunii-AnDI-115 grown in BG-11 medium and Ch. infusionum-AnDI-76 synchronous growth of cells of strains Setlik, Tamiya, modified Tamiya No. 1, modified Tamiya No. 2, CHu-10 nutrient medium was observed to be somewhat active. Including BG-11

Table 3.2.7

| Growth indicators and some biochemical characteristics of algal objects in BG-11 nutrient medium | | | | | | | | | | | |
|--|------------------------------|--|---------------------|---------------------|--------------------|--------------------------|---------------|--------------------------------|--------------------------|---|------------------------------|
| No | Selected algological objects | Number of cells in a cross-section of days | | | Cell dry mass, g/l | Amount of pigments, mg/l | | | | | |
| | | 3 | 7 | 10 | | chlorophyll a | chlorophyll b | Amount of total carotenoids, % | Amount of total pigments | Carotenoid content in relation to total pigments, % | Ratio of chlorophyll a and b |
| 1 | B. braunii- AnDI-115 | 2.3×10 ² | 3.2×10 ⁴ | 4.2×10 ⁶ | 14.13±0.36 | 13.72±0.23 | 8.12±0.51 | 4.63±0.88 | 26.47±0.09 | 17.49±0.36 | 1.7 |
| 2 | Ch. infusionum- AnDI-76 | 2.8×10 ² | 3.7×10 ⁴ | 5.1×10 ⁶ | 14.51±0.23 | 15.08±0.44 | 7.96±0.67 | 3.84±0.73 | 26.88±0.58 | 14.29±0.17 | 1.9 |

Note: The number of initially planted cells of the culture is 1.4×10²; Cell dry mass and pigment content were determined in 10-day-old cells. P<0.05

Table 3.2.7.1

| Effect of microalgae grown in BG-11 nutrient medium on seed germination | | | | | | | | | | |
|---|------------------------------|----------------------------------|------------|------------|--|------------------------|--------------|---|-----------|------------|
| No | Selected algological objects | Fertilization of seed in days, % | | | Biometric indicators of 15-day seedlings | | | Chlorophyll content of 15-day-old seedlings, mg/g of dry leaf | | |
| | | 3 | 5 | 7 | Seedling length, cm | Wet mass of sprouts, g | Root mass, g | a | b | a+b |
| 1 | B. braunii- AnDI-115 | 42.11±0.24 | 58.54±0.16 | 74.25±0.14 | 7.11±0.12 | 15.23±0.18 | 0.11±0.51 | 19.48±0.09 | 9.45±0.23 | 28.93±0.42 |
| 2 | Ch. infusionum- AnDI-76 | 38.18±0.33 | 54.41±0.12 | 76.62±0.18 | 6.43±0.06 | 13.41±0.09 | 0.10±0.62 | 21.11±0.27 | 8.78±0.38 | 29.89±0.57 |
| 3 | Control (IUK, 10-3M) | 52.16±0.17 | 79.19±0.25 | 92.16±0.52 | 10.18±0.37 | 47.11±0.28 | 0.62±0.72 | 14.39±0.46 | 9.56±0.62 | 23.95±0.19 |

B. braunii-AnDI-115 strain grown in culture medium 2.3×10² cells/ml on the 3rd day of culture, 3.2×10⁴ cells/ml on the 7th day of culture, 4 on the 10th day of culture, 2×10⁶ cells/ml, compared to Setlik (Table 3.2.1) and modified Tamiya No. 1 (Table 3.2.3) nutrient medium to two layers, Tamiya (Table 3.2.2), modified Tamiya It was noted that No. 2 (Table 3.2.4) and CHu-10 (Table 3.2.6) formed a higher number of cells per layer compared to the nutrient medium. It was found that CHu-13 (Table 3.2.5) showed somewhat similar parameters to the nutrient medium.

Also grown in BG-11 medium Ch. infusionum-AnDI-76 strain showed 2.8×10² cells/ml on day 3 of culture, 3.7×10⁴ cells/ml on day 7 of culture, and 5.1×10⁶ cells/ml on day 10 of culture, Setlik (Table 3.2.1) and modified Tamiya No. 1 (Table 3.2.3) compared to two layers of nutrient

medium, Tamiya (Table 3.2.2), modified Tamiya No. 2 (Table 3.2.4) and CHu- 10 (Table 3.2.6) was observed to produce a higher number of cells per layer compared to the nutrient medium, while CHu-13 (Table 3.2.5) showed a somewhat similar indicator compared to the nutrient medium (2.3×10^6 cells/ ml) was noted.

Also, it was noted that the biomass production properties of cultures in BG-11 nutrient medium compared to Setlik, Tamiya, modified Tamiya No. 1, modified Tamiya No. 2, CHu-10 nutrient mediums (Table 3.2.7). When we analyzed the obtained results, *B. braunii*-AnDI-115 strain grown in BG-11 nutrient medium was 8.33 g/l compared to Setlik nutrient medium, 8.93 g/l compared to Tamiya nutrient medium. 9.97 g/l compared to modified Tamiya No. 1 nutrient medium, 6.03 g/l compared to modified Tamiya No. 2 nutrient medium, 2.93 g/l compared to CHu-10 nutrient medium, 0.53 compared to CHu-13 nutrient medium was found to produce more biomass in g/l. against *B. braunii*-AnDI-115 strain grown in BG-11 medium *Ch. infusionum*-AnDI-76 It was noted that the strain produced more biomass in the amount of 0.38 g/l.

Also, *Ch. infusionum*-AnDI-76 11.91 g/l compared to that in the Setlik nutrient medium, 9.71 g/l compared to the Tamiya nutrient medium, 10.61 g/l compared to the modified Tamiya No. 1 nutrient medium, and compared to the modified Tamiya No. 2 nutrient medium compared to 7.31 g/l, CHu-10 produced 2.11 g/l more biomass compared to the nutrient medium, CHu-13 produced less biomass by 0.19 g/l compared to the nutrient medium.

B. braunii-AnDI-115 strain grown in BG-11 medium (26.47 mg/l) and *Ch. infusionum*-AnDI-76 strain (16.88 mg/l) showed a very close index to each other in terms of production of total pigments, but it was noted that it differed significantly in terms of carotenoid content in relation to total pigments. Including *B. braunii*-AnDI-115 strain grown in BG-11 nutrient medium 17.49%, *Ch. infusionum*-AnDI-76 strain was found to contain 14.29% carotenoids. There are also significant differences in the description of the amount of pigments in this nutrient medium. It was noted that *B. braunii*-AnDI-115 strain grown in BG-11 nutrient medium synthesizes chlorophyll a 13.72 mg/l, chlorophyll b 8.12 mg/l, and the amount of total carotenoids is 4.63%. . In the same nutrient medium *Ch. infusionum*- It was observed that strain AnDI-76 synthesizes chlorophyll a in the amount of 15.08 mg/l, chlorophyll b in the amount of 7.96 mg/l, and the total amount of carotenoids in pigments is 3.84%. Besides, In *B. braunii*-AnDI-115 strain grown in BG-11 medium, the ratio of chlorophyll a and chlorophyll b is 1.7, *Ch. infusionum* In the ANDI-76 strain, this ratio was found to be 1.9.

Table 3.2.7 shows the results of studying the effect of strains grown on BG-11 medium on seed germination and the amount of pigments in seedlings. When the germination of the seed treated with the culture fluid grown by the *B. braunii*-AnDI-115 strain was studied, it showed 42.11% germination on the 3rd day of observation, 58.54% on the 5th day of observation, and 74.25% on the 7th day of observation. it was noted that these indicators are 10.05%, 20.65% and 17.91% less than the control option, respectively. *Ch. infusionum*-The germination rate of the seed treated with the culture fluid grown by the AnDI-76 strain was 13.98% compared to the control on the 3rd day of observation. *B. braunii*- 3.92% compared to the AnDI-115 strain, 25.05% compared to the control on the 5th day of observation, 4.13% compared to the *B. braunii*-AnDI-115 strain, 15.54% compared to the control on the 7th day of observation. it was found that it showed 4.37% more fertility than *B. braunii*-AnDI-115 strain.

It was noted that the biometric parameters of seedlings grown by treatment with cultures grown in BG-11 nutrient medium were also different. In particular, the length of sprouts grown under the influence of *B. braunii*-AnDI-115 strain was 7.11 cm, the wet biomass of sprouts was 15.23 g, and the root mass was 0.11 g. *Ch. infusionum*- It was noted that the length of seedlings grown under the influence of AnDI-76 strain was 6.43 cm, the wet mass of seedlings was 13.41 g, and the root mass was 0.10 g. According to the obtained results, it was found that the control option has a clear advantage in all parameters of biometric observations.

When the chlorophyll retention of seedlings treated with cultures grown on BG-11 medium was studied, dramatic differences were observed compared to the control. In particular, the content of a and b chlorophylls in seedlings grown under the influence of *B. braunii*-AnDI-115 strain is 4.98 mg/g compared to the control. *Ch. infusionum* It was found that the amount of chlorophylls a and b of seedlings grown under the influence of AnDI-76 strain was higher by 4.94 mg/g (dry leaf basis) compared to the control. Also, retention of chlorophyll a of the control variant *B. braunii*- 5.09 mg/g compared to chlorophyll a of seedlings grown under the influence of AnDI-115 strain, *Ch. infusionum* It was observed that the seedlings grown under the influence of AnDI-76 strain were less than 6.72 mg/g of chlorophyll a. The control variant (9.56 mg/g) is significantly higher in chlorophyll b content *B. braunii*-AnDI-115 (9.45 mg/g) and *Ch. infusionum*-AnDI-76 (8.78 mg/g) was different from the strains.

In subsequent studies, the characteristics of *B. braunii*-AnDI-115 and *Ch. infusionum*-AnDI-76 strains, the production of dry biomass and the synthesis of pigments were studied in the Bold basal nutrient medium (Table 3.2.8). When the obtained results were compared, it was noted that *B. braunii*-AnDI-115 strain compared to *Ch. infusionum*-AnDI-76 strain in Bold bazao nutrient medium differed in the synchronous reproduction of cells with very small differences. In particular, the *B. braunii*-AnDI-115 strain grown in Bold basal medium had 4.7×10^2 cells/ml on the 3rd day of cultivation, 5.1×10^4 cells/ml on the 7th day of cultivation, 9.3×10^6 cells/ml on day 10 compared to Setlik (Table 3.2.1) and modified Tamiya No. 1 (Table 3.2.3) culture medium, Tamiya (Table 3.2.2), modified Tamiya No. 2 (Table 3.2.4) and CHu-10 (Table 3.2.6) were observed to produce a higher number of cells per plate compared to nutrient medium, CHu-13 (Table 3.25) and It was noted that BG-11 showed a slightly higher rate (9.3×10^6 cells/ml) compared to nutrient media.

Also, *Ch. infusionum*-AnDI-76 strain grown in Bold basal medium had 4.8×10^2 cells/ml on the 3rd day of cultivation, 5.6×10^4 cells/ml on the 7th day of cultivation, On day 10, it was found to show a reading of 8.4×10^6 cells/ml. *Ch. infusionum*-AnDI-76 strain on the synchronous increase in the number of cells compared to Setlik (Table 3.2.1) and modified Tamiya No. 1 (Table 3.2.3) medium in two layers, Tamiya (Table 3.2.2), modified Tamiya No. 2 (Table 3.2.4) and CHu-10 (Table 3.2.6) were observed to produce a higher number of cells per plate compared to nutrient medium, CHu-13 (Table 3.25) and It was found that BG-11 showed higher cell count (8.4×10^6 cells/ml) compared to culture media.

Although *B. braunii*-AnDI-115 and *Ch. infusionum*-AnDI-76 strains grown in Bold basal nutrient medium showed similar indicators in terms of dry biomass production characteristics, compared to those in other nutrient mediums it was found that it produced more biomass. In particular, the *B. braunii*-AnDI-115 strain compared to the one in the Setlik nutrient medium was 10.21 g/l, the *Ch. infusionum*-AnDI-76 strain was 10.33 g/l, the *B. braunii*-AnDI-115 strain was 9, compared to the one in the Tamiya nutrient medium. 81 g/l, strain *Ch. infusionum*-AnDI-76 9.43 g/l, strain *B. braunii*-AnDI-115 10.91 g/l, strain *Ch. infusionum*-AnDI-76 compared to that in modified Tamiya No.1 medium 10.33 g/l, compared to modified Tamiya No. 2 nutrient medium, *B. braunii*-AnDI-115 strain 6.91 g/l, *Ch. infusionum*-AnDI-76 strain 7.03 g/l, compared to CHu-10 nutrient medium *B. braunii*-AnDI-115 strain 3.81 g/l, *Ch. infusionum*-AnDI-76 strain 1.83 g/l, CHu-13 in nutrient medium

Table 3.2.8

Growth indicators and some biochemical characteristics of algal objects in Bold basal nutrient medium

| No | Selected algological objects | Number of cells in a cross-section of days | | | Cell dry mass, g/l | Amount of pigments, mg/l | | | | | |
|----|------------------------------|--|---------------------|---------------------|--------------------|--------------------------|---------------|-------------------------------|--------------------------|---|------------------------------|
| | | 3 | 7 | 10 | | chlorophyll a | chlorophyll b | Amount of total carotenoids % | Amount of total pigments | Carotenoid content in relation to total pigments, % | Ratio of chlorophyll a and b |
| 1 | B. braunii - AnDI-115 | 4.7×10 ² | 5.1×10 ⁴ | 9.3×10 ⁶ | 15.01±0.09 | 23.04±0.32 | 12.37±0.09 | 8.13±0.33 | 43.54±0.28 | 18.67±0.11 | 1.9 |
| 2 | Ch. infusionum - AnDI-76 | 4.8×10 ² | 5.6×10 ⁴ | 8.4×10 ⁶ | 14.23±0.17 | 22.43±0.47 | 11.68±0.53 | 7.48±0.24 | 41.59±0.18 | 17.99±0.48 | 1.9 |

Note: The initial number of cultured cells is 1.2×10²; Cell dry mass and pigment content were determined in 10-day-old cells. P<0.05

Table 3.2.8.1

Effect of microalgae cultured in bold basal nutrient medium on seed germination

| No | Selected algological objects | Fertilization of seed in days, % | | | Biometric indicators of 15-day seedlings | | | Chlorophyll content of 15-day-old seedlings, mg/g of dry leaf | | |
|----|------------------------------|----------------------------------|------------|------------|--|------------------------|--------------|---|------------|------------|
| | | 3 | 5 | 7 | Seedling length, cm | Wet mass of sprouts, g | Root mass, g | a | b | a+b |
| 1 | B. braunii - AnDI-115 | 52.45±0.14 | 78.14±0.11 | 74.25±0.24 | 9.68±0.16 | 17.03±0.18 | 0.14±0.11 | 23.12±0.09 | 10.23±0.44 | 33.35±0.03 |
| 2 | Ch. infusionum - AnDI-76 | 38.18±0.33 | 72.32±0.25 | 76.62±0.18 | 8.72±0.41 | 15.47±0.32 | 0.13±0.73 | 22.81±0.32 | 9.72±0.53 | 32.53±0.16 |
| 3 | Control (IUK, 10-3M) | 52.16±0.17 | 82.91±0.15 | 96.32±0.17 | 10.28±0.52 | 48.08±0.28 | 0.83±0.15 | 16.12±0.81 | 6.92±0.18 | 23.04±0.49 |

compared to B.braunii-AnDI-115 strain produced 1.41 g/l more biomass, Ch.infusionum-AnDI-76 strain grown in CHu-13 nutrient medium compared to 0 It was found that it produced more biomass in the amount of .4 g/l.

The effect of microalgae grown in Bold basal medium on seed germination is shown in Table 3.2.8.1. In the comparative analysis of the obtained results, the germination of the seed treated with the culture liquid grown by B. braunii-AnDI-115 strain was 52.45% on the 3rd day of observation, 78.14% on the 5th day of observation, 74% on the 7th day of observation. 25% fecundity, these indicators showed 0.29% higher fecundity on the third day compared to the control option, 4.77% on the 5th day of observation, and 22.07% less fecundity on the 7th day of observation. was recorded. Fertilization of the seed treated with culture fluid grown by Ch.infusionum-AnDI-76 strain was 13.98% compared to the control on the 3rd day of observation, 14.27% compared to the B. braunii-AnDI-115 strain, and 10% compared to the control on the 5th day of observation. ,59%, compared to B.braunii-AnDI-115 strain 5.82%, on the 7th day of observation, 19.7% showed less viability compared to the control, compared to B.braunii-AnDI-115 strain 2.37% more It was found that it showed more flexibility.

It was noted that the biometric parameters of seedlings grown by treatment with cultures grown in Bold basal nutrient medium were also different. In particular, the length of seedlings grown under the influence of B. braunii-AnDI-115 strain was 9.68 cm, the wet biomass of seedlings was 17.03 g, and the root mass was 0.14 g, while Ch. infusionum- It was noted that the length of seedlings grown under the influence of AnDI-76 strain was 8.72 cm, the wet mass of seedlings was 15.47 g, and the root mass was 0.13 g. According to the obtained results, it was found that the control option has a clear advantage in all parameters of biometric observations. In particular, it was determined that the length of the sprouts was 10.28 cm, the wet biomass of the sprouts was 48.08 g, and the root mass was 0.83 g.

When the chlorophyll retention of seedlings treated with cultures grown in Bold basal nutrient medium was studied, it can be seen that they showed somewhat higher values compared to the control. In particular, the amount of chlorophylls a and b of the seedlings grown under the influence of B. braunii-AnDI-115 strain is 10.31 mg/g compared to the control, and the chlorophylls a and b of the seedlings grown under the influence of Ch.infusionum-AnDI-76 strain it was determined that the amount was 9.49 mg/g (dry leaf basis) higher than the control. Also, the chlorophyll a retention of the control variant is 7.0 mg/g compared to the chlorophyll a of the seedlings grown under the influence of the B. braunii-AnDI-115 strain, compared to the chlorophyll a of the seedlings grown under the influence of the Ch. infusionum-AnDI-76 strain. It was observed that it was less than 6.69 mg/g. According to the content of chlorophyll b, the control variant (6.92 mg/g) was significantly higher than the B. braunii-AnDI-115 (10.23 mg/g) and Ch. infusionum-AnDI-76 (9.72 mg/g) strains. it was found that it showed low performance.

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